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Strategic Plan

for

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Preliminary Draft

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ID # 88001614

HD
183
.L3
L345
1974

Draft Report

Strategic Plan for Information Systems

Information and Data Management Study

for the

Bureau of Land Management

United States Department of Interior

Contract Number 08-550-CT4-14

Prepared by the

Strategic Plan Study Team

BLM-Denver

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Section 1. PREFACE

This document is the result of an information requirements identification, definition and analysis project for the Bureau of Land Management (BLM) undertaken jointly by a specially assigned inhouse task force and the Federal Systems Division (FSD) of the International Business Machines Corporation.

The objective of this project was to develop a master plan for the management and development of a BLM information system which would include:

a. A description of the parameters and functions of the recommended system and subsystems.

b. A description of the relationship and linkage between the proposed subsystems.

c. A basis for informed directorate decisions as to the merits of implementing any individual subsystem.

To provide direction and focus to the project, the following guidance concepts were provided:

a. The recommended system must provide support to all organizational levels of BLM, with special emphasis on assisting the manager in the field.

b. The recommended system design must contain the flexibility to integrate new developments in automated data processing or remote sensing technology.

c. The recommended system design must include the ability to be developed and/or implemented in independent modules.

d. The recommended system must be based upon and support the presently existing BLM organizational structure and procedures.

d. The recommended system development and implementation schedule must be based upon BLM anticipated levels of resources.

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Section 3. INTRODUCTION

This document contains information germane to the function of long range planning for the development and implementation of information systems for the Bureau of Land Management. A recommended conceptual system configuration, the BLM jobs it might support, considerations peripheral to its implementation and a proposed schedule and estimated costs are the major topics described herein.

The introduction will trace the history of BLM information requirements, outline the possible uses of the document, discuss the relationship of the plan to the other project documents, and describe how this documented material should be maintained.

3.1 BACKGROUND

The requirement for information to assist in the management of federally owned lands has increased steadily since the formation of the government. This growth has accelerated dramatically in recent years. The following chronicles the events that have precipitated this rising need for data.

Independence of the colonies demanded a degree of intra-equality among the now free states if they were to survive as a confederation. A major concern of smaller confined members, such as Maryland and New Jersey, was that unconfined states, with indefinite grants, would expand settlement and control any confederation of the new states. Thus, the cession of lands (about 237 million acres) starting in 1781 by the original states put the United States into the public land business. Following this; the Louisiana Purchase (1803), the Spanish Purchase (Florida-1819), Texas admission to the Union and sale of the northwestern portions of the state to the United States (1850), the Mexican-American War Treaty Lands (1848), the Gadsden Purchase (1853), the 1846 Treaty with Great Britain (Pacific Northwest-1846) and finally "Seward's Folly", the Alaskan Purchase (1867),put the United States government into the largest land records business in the world.

The first tracts of public lands were sold in 1787 at the office of the Board of Treasury, Federal Building, lower New York City. Subsequently, on March 4, 1778, the first patent was issued to John Martin. This initial transaction required not only records of acquired lands, but also disposal of lands which might be made under statutes provided by Congress exercising its authority for the disposal of public lands reserved to the Congress in the Constitution.

Disposal of lands required not only ownership by the Government, but also a description to separate the disposed from the retained and to establish boundaries between future owners. Thus, by the Ordinance of 1785 a system of rectangular survey was ordered which now covers most of the United States. In 1786 Abraham Martin provided the first survey records, which since that time have controlled boundary ownership lines for corporation, farmer and urban home owner alike in most of the United States.

By 1812 the job of storing, retrieving and using these records was so great that Congress recognized the wisdom of Alexander Hamilton's 22 year old proposal and established the General Land Office (GIO) in Washington, D.C. This office was still under the jurisdiction of the Treasury Department.

Land grants for railroads, colleges, charitable institutions, wagon roads, canals, along with sales and military bounty warrants, made the record keeping requirement even more definitive. The GLO needed to establish new regulations to interpret congressional statutes and qualifications of applicants.

In 1843 Commissioner Thomas Blake complained about the volume of private land claims, under previous French, Spanish and Mexican grants, that required adjudication. Transfers of land under Indian tribe treaties further burdened the operations of the General Land Office.

In 1865 the entire pattern of settlement was changed by the passage of the Homestead Act, which awarded 160 acres to every settler and farmer who lived on the tract for at least 5 years. If the GIO was understaffed prior to this congressional gift, it was now almost inundated by the tide of entries or applications for homestead tracts. By 1874 the GLO was granting over a million and a half acres annually to over 14,000 applicants. By the early 1920's most of the good homesteading (farming) land was gone and the frontier had been pushed smack against the face of the Rocky Mountains, but there was still a lot of unappropriated public domain left--around 500 million acres.

As early as 1850 GLO officials, now under the Department of the Interior, sent the first Federal timber agents to protect public land forests. This was a harbinger of things to come. Near the turn of the century the disposal policy of the Government began to change as extensive forest withdrawals were made by several presidents, principal among them being Theodore Roosevelt. Further, with sweeping mineral withdrawals, public land management was beginning to emerge with its demands for resources inventory, factual data gathering, storage, analysis and retrieval for about three-fourths billion acres of land and much more land over federally reserved mineral rights.

In 1934, after decades of political and physical fighting between western livestock men, the Taylor Grazing Act was passed,

reserving the remaining public lands in the west for classification as to how they might best serve the public interest. It was now inevitable that large acreages in addition to those reserved for National Forests, Parks and Wildlife Refuges would remain in public ownership for a long period of time. These were supervised for surface use by a new agency, the Grazing Service, which lasted until 1945 and was thence joined to the General Land Office and called the Bureau of Land Management. On June 20, 1970, the report of the Public Land Law Review Commission to the President of the United States capped the inevitable by stating:

> "We, therefore, recommend that: The policy of large-scale disposal of public lands reflected by the majority of statutes in force today be revised and that future disposal should be of only those lands that will achieve maximum benefit for the general public in non-Federal ownership while retaining in Federal ownership those whose values must be preserved so that they may be used and enjoyed by all Americans."

The intent was legalized by BLM actions under the Multiple Use and Classification Act of 1964.

In the east and midwest, economic development and settlement had taken place under a philosophy of private ownership and management, each 160 acre tract of land having its overseer, manager owner. This man knew every nook and cranny on his farm. He was a walking data storage system. In the West a new concept of Government, multiple use management, had developed which is not only complicated by the small number of persons (about 5,000 permanent in BLM) trying to manage a large acreage--451 million acres of land and millions of additional mineral acreages under private surface--but also from a concept that more than one overriding goal must be met. Where the farmer managing his 160 acres was occupied with maximizing profits while maintaining a productive farm, BLM administrators find themselves required to manage and allow for many uses of resources and land. The allocaton of land and resource use is difficult at best, but BLM managers while attempting to manage programs of lands, minerals, forestry, grazing, wildlife, watershed, recreation, protection and cadastral survey find extreme problems in being as familiar with the lands as this management requires. In many cases today, records are lost or are old, inventories are outdated or inaccurate because of the use of old techniques or the

information has never been collected. This is mainly because of chronic shortages of personnel and recurring crisis requirements. Informaton that has been collected by numerous other agencies and individuals is difficult to locate and use.

Although the leasing of upland and outer continental shelf oil has been important for some time, the impact of mineral extraction (particularly coal and uranium) in the West has not been apparent until the last five years. This extraction program with its appurtenant power generation facilities and related structures closely related to energy shortage solutions has had traumatic impact on BLM's operational capabilities. This is so much so that certain problems in the Bureau can be identified as those relating to mineral and energy producing or potential districts or offices as opposed to different priorities or problems related to non-energy and mineral producing districts or offices. Where little information was necessary under a custodial minerals system, now large amounts of data are required in response to attempts at minerals management brought about by overwhelming interest in development and exploration.

BLM administrators knew of the difficulties of obtaining resource inventory and management information under the thousands of public land laws that required management in some form on the public lands, but the tidal wave that drowned the leaky resource data base thus far established was the passage of the National Environmental Policy Act of 1969. This act requiring appraisal of all BLM approved actions, not only required analysis of information foreign to BLM (air quality, socio-demographic, water pollution, etc.), but also required analysis of lands, waters and air not even under BLM jurisdiction.

Today, the public and official demand for land use and resource information, spurred by the energy crisis, the heightened concern involving the environment and ecology, and incipient apprehensions regarding future mineral shortages, have placed overwhelming burdens on the present data handling capacity of the Bureau.

Thus, evolved BLM's present dilemma and major problem--adequate collection, storage, retrieval and analysis of the data required to meet these obligations that have evolved during the history of the Bureau. The answer to this problem may not be to have an overseer for each 160 acres (3 million BLM people), but to develop an efficient data system which would allow maximum utilization of the present force.

To address this situation, BLM management decided that a logical initial step would be to ascertain, to the fullest extent possible, the present Bureau environment and associated problems regarding information. After having obtained this picture, this would be used as a basis to chart a course for the organization to travel over several years in order to realize an information system that would satisfy the identified requirements. This charted course is the BLM Strategic Plan for Information Systems.

3.2 USES

The Strategic Plan has been developed with the intent of providing a basis for future BLM management decisions and planning functions involving information systems. To accomplish this purpose it will:

a. Provide descriptions of potential future applications of an automated information system.

b. Provide general descriptions of potential future applications of remote sensing technology.

c. Provide information regarding the relationships and dependencies among potential applications.

d. Provide a description of the current support provided by existing BLM information systems and identify associated problems.

e. Provide a platform for the launching of detailed requirement studies and system design efforts.

f. Provide a generic hardware configuration and software architecture necessary to satisfy BLM information requirements.

g. Provide gross cost estimates for the accomplishment of the recommended system which are representative of the current market place and can be used for long range planning, but not for near term budget preparation.

h. Provide a realistic calendar schedule of events and activities required for implementation of the recommended system in light of anticipated Bureau resource availability.

By definition, a strategic plan includes considerations involving a total situation and then projects events into the future as far as can be feasibly foreseen. Obviously, short range activities and their relationships can be forecast in much greater detail than those further out in time. All elements of the BLM operation must be included to similar levels of detail in such a plan to provide management with information necessary to maintain the proper organizational perspective and balance. Also, impacts

of a possible decision must be predicted throughout the entire organization to thoroughly test its validity. A long range plan furnishes the mechanism for management and strategic planners to examine these possible ramifications of actions which are under deliberation. Characteristics associated with strategic planning are that the information and estimations are general, neutral and imprecise. Generally, management should not look to this type of document for motivation toward a certain course of action, but for basic information regarding alternatives that should be examined.

A distinction must be made between strategic planning and day-to-day management control of an operation, because these activities often find themselves in conflict. These differences are well defined in "Planning and Control Systems, A Framework for Analysis", by Robert N. Anthony:

> "Strategic planning is the process of deciding on objectives and policies. It has to do with major decisions with long-term consequences. Management control has to do with the ongoing operation of the enterprise, within the guidelines established by these policies.
>
> Although we recognize that one process shades into the other, we nevertheless believe that significant distinctions can be drawn between them. These are summarized in the following table. Unless these distinctions are understood, mistakes will be made in (1) stating generalizations as if they were applicable to both processes, (2) applying to one process a generalization that is valid only for the other, and (3) giving too much emphasis to one process and not enough to the other."

Some Distinctions Between Strategic Planning and Management Control

Characteristic	Strategic Planning	Management Control
Focus of plans	On one aspect at a time	On whole organization
Complexities	Many variables	Less complex
Degree of structure	Unstructured and irregular; each problem different	Rhythmic; prescribed procedures
Nature of information	Tailor made for the problem; more external and predictive; less accurate	Integrated; more internal and historical; more accurate
Communication of information	Relatively simple	Relatively difficult
Purpose of estimates	Show expected results	Lead to desired results
Persons primarily involved	Staff and top management	Line and top management
Number of persons involved	Small	Large
Mental activity	Creative; analytical	Administrative; persuasive
Source discipline	Economics	Social psychology
Planning and control	Planning dominant, but some control	Emphasis on both planning and control
Time horizon	Tends to be long	Tends to be short
End result	Policies and precedents	Action within policies and precedents
Appraisal of the job done	Extremely difficult	Much less difficult

This plan for BLM goes further than the traditional strategic plan in that it does draw some rather specific conclusions from

the analysis performed and presents these in the form of recommendations and schedules.

The goal of this plan, then is to consider as many factors as possible, within the allotted resources, which are pertinent to the objective of achieving a successful integrated management information system. This information will then be available in a structured and usable format to those Bureau personnel tasked with the realization of that objective.

3.3 FINAL REPORT RELATIONSHIP

The documents comprising the Final Report supply background information to the Strategic Plan, in that they contain the event-by-event history of the total project which culminated in the preparation of the plan. The project effort was divided into five phases and accompanying Final Report documents have been written describing the activities affected within each phase. The five Final Report documents are:

a. Planning and Coordination - Phase I

   This document describes the general project planning and coordination tasks that were undertaken prior to initiation of the project activities. Primarily emphasized in this phase was the preparation for the data collection efforts to be conducted in the site survey.

b. Site Survey and Analysis - Phase II

   This document describes the actual site surveys and the results obtained. The efforts employed to organize these results into BLM functional information requirements are explained.

c. Data/Technology Survey - Phase III

   This document describes the state-of-the-art capabilities of remote sensing technology and their possible application to the data acquisition requirements of BLM. Technical manuals providing independent descriptions and evaluations of presently available ADP hardware and software were furnished as part of the documentation of this phase.

d. System Recommendations - Phase IV

   This document describes the methodology utilized to translate the BLM functional requirements into a recommended conceptual design, including hardware, software, network and data base considerations.

e. Plan Formulation - Phase V

This document describes the deliberations undertaken in developing the calendar schedule and the cost estimations which incorporate the Strategic Plan.

3.4 MAINTENANCE

The plan format was developed with the idea in mind that future decisions and events would impose accompanying modifications to the document. The sections believed most susceptible to change have been grouped together. These are Section 5 - Conceptual System Configuration; Section 6 - Application Packages; Section 7 - Implementation Considerations; and Section 8 - Strategic Plan.

Of course, the Strategic Plan section will be the most dynamic, as almost any change required to any other section will cause an associated change in the plan. Adjustments to the BLM mission or budget, changes in technology and fluctuations in the marketplace all would demand appropriate revisions to the plan.

Responsibility and authority for maintaining the plan as a current and viable instrument should be definitively placed within the BLM organization.

Section 4. EXECUTIVE SUMMARY

To be provided in the final version.

Section 5. CONCEPTUAL SYSTEM CONFIGURATION

5.1 SYSTEM HARDWARE CONFIGURATION

5.1.1 Introduction

The concept of a centralized network finds best application in an environment where the user desires to maintain a concentration of software development and upkeep, a centralized storage of the system data; i.e., a data base, and limited system support and maintenance at the locations which are remote from the Central Processing Unit (CPU). Let us consider, for a moment, the centralized or star network concept as it contrasts with a decentralized or distributed intelligence (computing capability) type of network.

In a decentralized network, computing power is established at major communicating points within the network. In the case of the Bureau of Land Management, a small or medium range computer would be installed at each state office with a full set of communication lines to each of its reporting districts and a major communicating trunk back to the host CPU in Denver. Figure 1 details this type of network. The state office CPU's would contain identical control programs, application programs, and network control programs. Each state CPU would operate independently of the other state CPU's in support of its own network (own districts) and execution of its own programs.

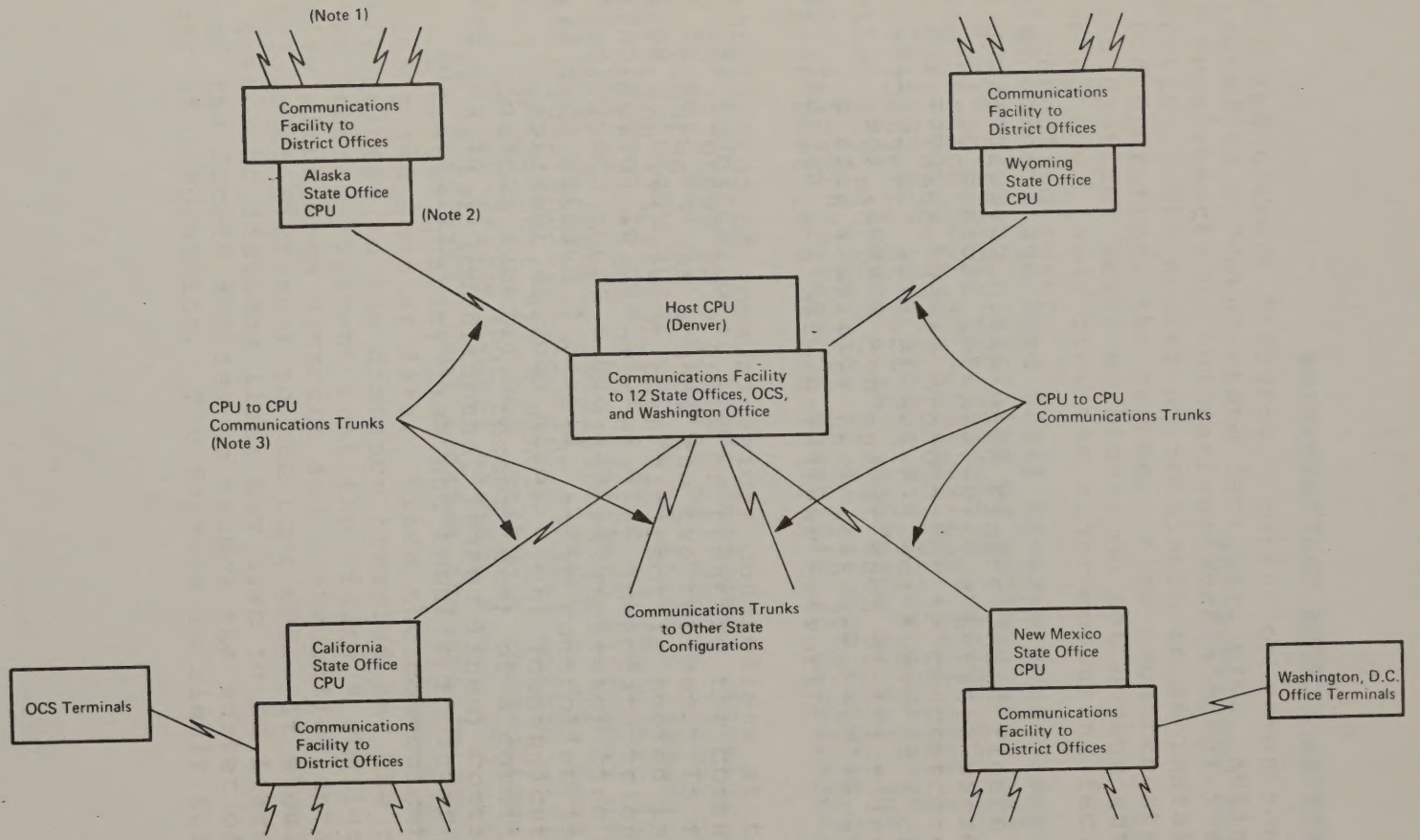

(Note 1)
Communications Facility to District Offices
Alaska State Office CPU
(Note 2)
Communications Facility to District Offices
Wyoming State Office CPU
Host CPU (Denver)
Communications Facility to 12 State Offices, OCS, and Washington Office
CPU to CPU Communications Trunks (Note 3)
CPU to CPU Communications Trunks
Communications Trunks to Other State Configurations
OCS Terminals
California State Office CPU
Communications Facility to District Offices
New Mexico State Office CPU
Communications Facility to District Offices
Washington, D.C. Office Terminals

Figure 1. Distributed Intelligence Network

Notes:

1. Each district would have a complete set of full dial-up (standard telephone) lines from its terminal control unit to the state office computer.
2. Each state would require a full computing facility with software, communications channels, tape drives, card readers, printers, graphics equipment, core storage, and direct access storage devices.
3. Depending on the communications volume, each communications trunk may have to be a high speed conditioned, leased line (more expensive).

This degree of autonomy however, presents some problems. In addition, this kind of distributed intelligence (decentralized) network would provide BLM with computer power far beyond its requirements. Let us consider each of these problems.

In the network described in Figure 1, each state would have to maintain a complete set of software packages. Each state would have to staff a programming organization and a support organization (computer operators, etc.). A network maintenance organization would have to be retained to ensure that state organizations adhere to standards, to affect and control changes to all state CPU hardware and software configurations and programs, and to maintain the host CPU in Denver which now becomes a message switching center, a back-up CPU, and a network control CPU. Let us consider this further.

Any communications from one state facility to another state facility or from a district in one state to a district in another state must be routed through the host CPU in Denver. This computer (in Denver) then takes on the role of switching messages from one network CPU to another network CPU. This kind of function can be affected more efficiently in a centralized network because there are no intervening CPU's. In considering the Bureau's requirements, the complexity of a district-terminal to a state-host to a message switching CPU (Denver) to a state-host to a district-terminal....and the anticipated traffic (communications line activity) of this kind, does not warrant such an elaborate configuration.

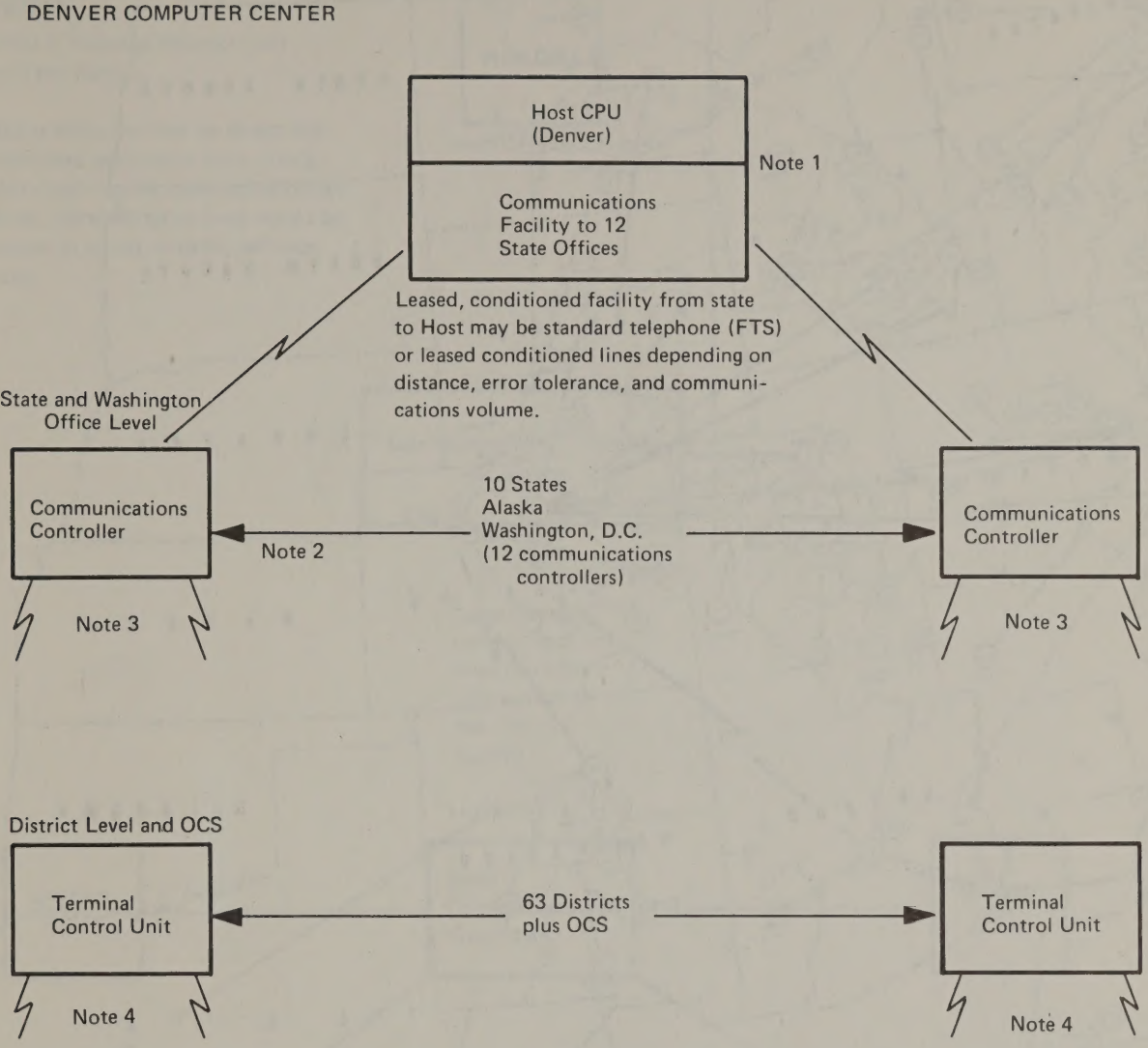
Furthermore, a real-time facility such as is used by NASA or the military ....a facility where dynamic updates of the data base occur on a timely basis, cannot tolerate a moment of down-time (computer failure). Under these circumstances, back-up facilities or parallel computer configurations are considered a "must." It is necessary that the back-up computer take over immediately upon the failure of the main or active CPU. This kind of failure-proof computer system is not necessary in BLM and so this kind of network (de-centralized) with a back-up CPU in Denver cannot be justified.

Finally, a distributed network of the kind described in Figure 1 must have a network control CPU or a master controller such as would be the other function (in addition to back-up and message switching) of the Denver facility. The responsibilities associated with this task are many, including network accounting, reporting

state CPU and network failures, routing or retention of messages to be routed to a "down" state facility, etc. Again, the Bureau's current requirements do not warrant such a complex and expensive configuration. The number of terminals to be installed for the entire BLM operation, the response time requirements, and the state and district level workloads do not demand any substantial down-range, i.e., away from the major computing facility at Denver, computing power.

The proposed configuration (see Figure 2 and Figure 6 in the Software Section 5.2) is a centralized network where the majority of the intelligence (data processing) is concentrated at a single facility (Denver). At each state level there is a communications controller instead of a CPU and at each district level facility there is a terminal control unit with attached terminals (as there would have been in a de-centralized network).

The installation of communications controllers at the state office levels is intended as a means of reducing the communications line costs. Figures 3 and 4 show the two options. In the recommended configuration (Figure 3) each district is hooked into the network via the short distance of a dial-up (standard telephone: FTS or WATS) line or a leased, conditioned (private) line to the state communications controller. The state controller is, in turn, attached to the host via a single trunk (communications link) on what may be a dial-up (not recommended) or a conditioned, leased line. The latter (conditioned, leased lines) costs more but assures a better quality line and results in fewer transmission line errors and loss of data. Since the communications costs are directly related to the distance traveled and the type of line used, it becomes apparent that the Figure 4 configuration is more expensive since each district and state office attaches directly (regardless of distance) to the host CPU. It should be noted again that long distance lines may have to be leased, conditioned lines if the Bureau desires to reduce the number of data errors and loss of information. The formula is simply this:



NOTES:

1. All software is concentrated in the host CPU. No software is developed or maintained at the state or district levels.
2. Each controller may be a standard communications controller or a mini-computer.
3. A communications controller controls all the terminal control units of the districts reporting through that state office. The communications links are standard telephone (dial-up) lines, in the minimal approach, and leased conditioned in the recommended and future approaches.
4. All terminals in a district office are directly attached to the terminal control unit at that office. These terminals include (1) a graphic terminal, (2) an alphanumeric video terminal, (3) an alphanumeric terminal, (4) a hard copy device (printer), and (5) a graphic tablet.

Figure 2. Centralized Network

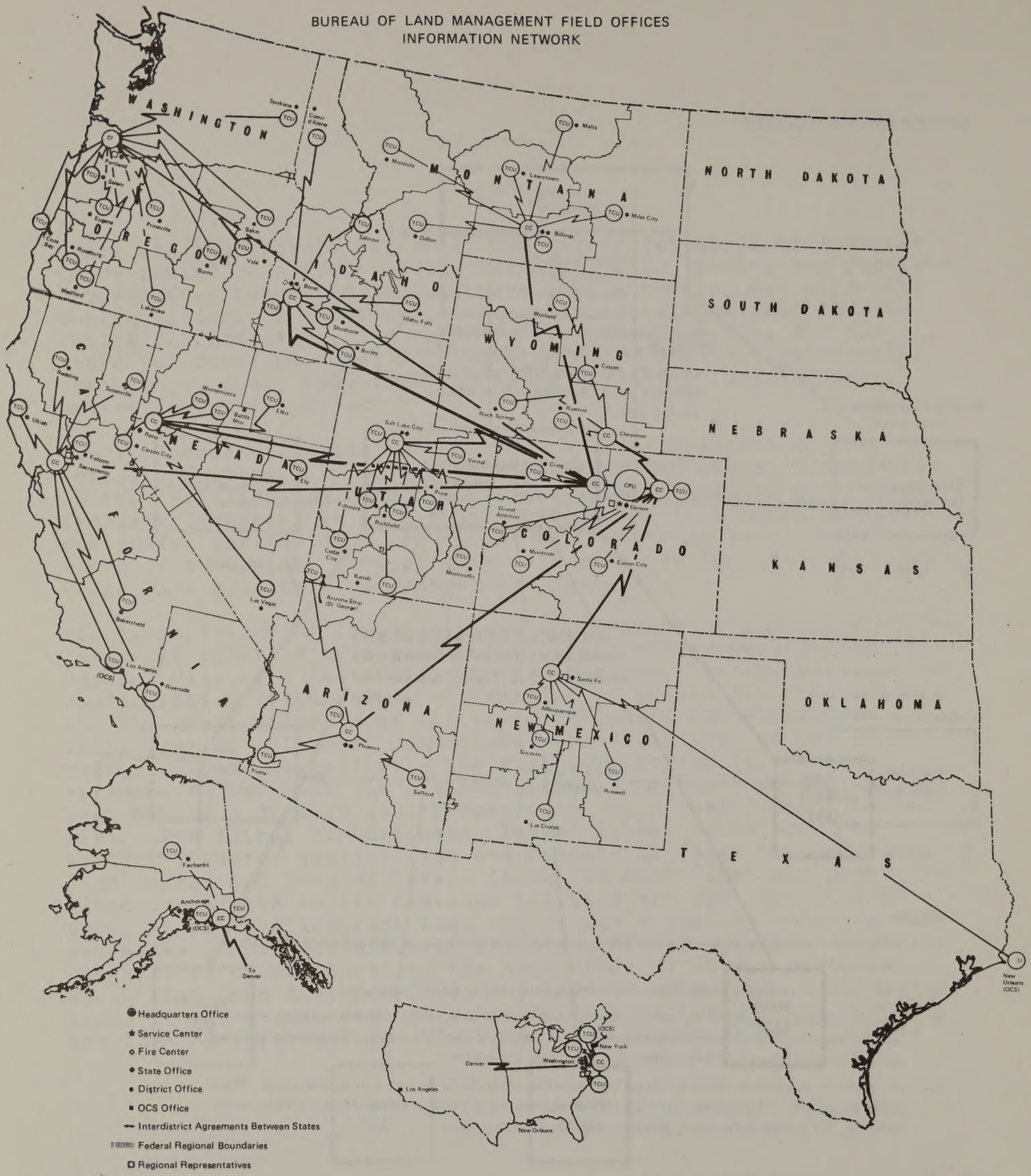


Figure 2a. Bureau of Land Management Field Offices Information Network

NOTES:

TCU is Terminal Control Unit . . . one per district.

Short distances may be direct dial (standard telephone) lines. Long distances may be leased conditioned lines. Short distance lines would be better as leased conditioned lines also.

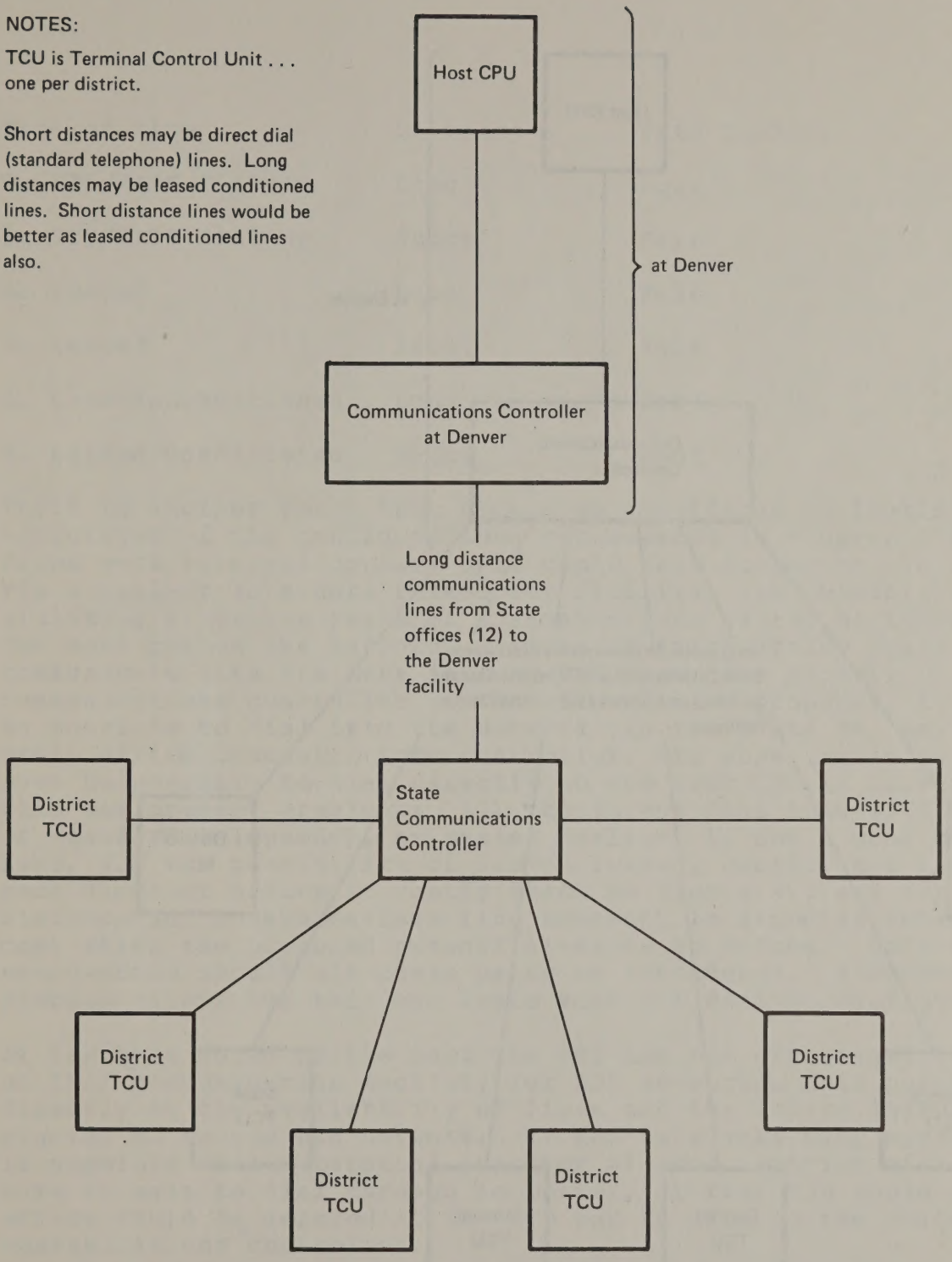


Figure 3. District Through State CC to Host

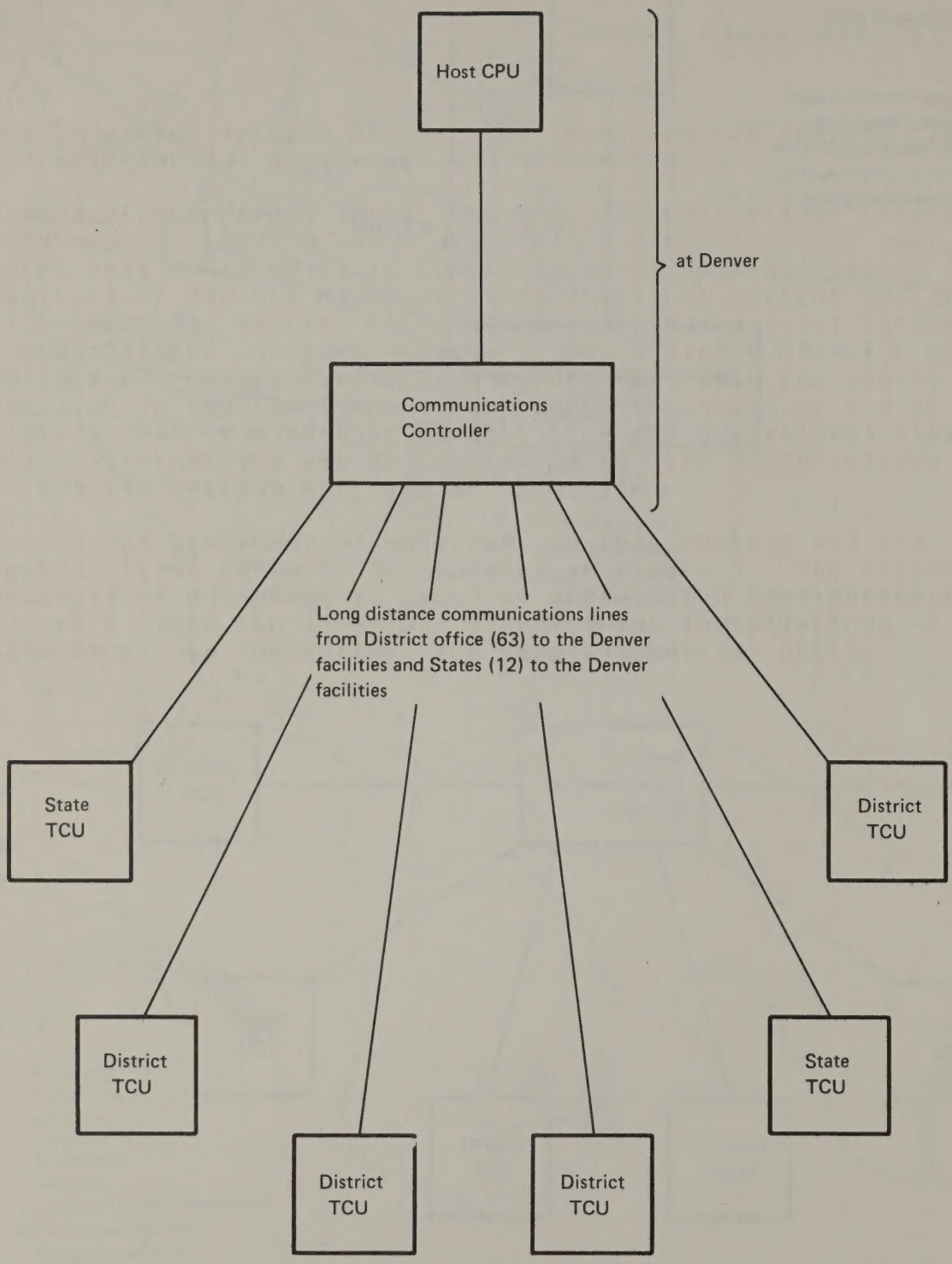


Figure 4. Direct District to Host

Type of line	Distance	Data Quality	Cost
1. FTS/WATS Dial-up	Long	Poor	Low
2. FTS/WATS Dial-up	Short	Fair	Low
3. Leased	Long	Fair	Medium
4. Leased	Short	Fair	Medium
5. Leased/Conditioned	Long	Good	High
6. Leased/Conditioned	Short	Good	High

There is another point that should be considered in looking at the advantages of the configurations recommended in Figures 2 and 3. Since each terminal control unit could have access to the network via a dial-up (standard telephone) facility, the possibility of utilizing alternate paths of communications cannot be ignored. If for some reason the Safford, Arizona district office could not communicate with the host in Denver because the Phoenix communications controller was not functioning properly, it would be possible to dial into the network via the Santa Fe, New Mexico state office communications controller. In some instances it may even be possible to dial directly to the host CPU in Denver but this may present problems: (1) the direct dial line (FTS or WATS or standard telephone), as stated earlier, is not a good quality line, (2) the possibility of having leased, conditioned lines at each district office is costly (back to Figure 4), and (3) distance (of communications line hook-up) is directly related to cost which the proposed network attempts to reduce. Only in emergencies should alternate paths be considered. A fourth problem exists but this one deals with all dial-up configurations.

It has been noted in the past the FTS has not encouraged the use of that communication facility for ADP networks. This points directly to the availability of lines and the delays inherent in signing on to the BLM network. If FTS is a very busy system, it is possible that a terminal operator at some district office could have to wait to dial through to Denver, or that the whole district office could be delayed if the TCU had no line to the state communications controller.

The section which follows; titled, Line Considerations, further discusses the minimal system, the recommended system, and the

future system apropos the network configuration and the line characteristics: advantages and disadvantages.

The ensuing sections detail the proposed centralized network along with several figures and a discussion of the level of computing power that would exist at the state level (communications controller) and the district level (terminal control units). It is recommended at this time that a distributed intelligence (decentralized) network (Figure 1) and a direct district office-to-host-CPU configuration is not required; that the system detailed in Figures 2 and 3 best meets the needs of BLM at a minimum cost from both an installation and operational viewpoint. Other alternatives may be considered but the decentralized network is not the optimum approach at this time.

A detailed breakdown of equipment in both centralized and decentralized networks is included in Figure 5. The estimated quantity of equipment is based on anticipated configurations. Figure 6 lists the locations proposed for installations of communications controllers and terminal control units.

Equipment	Centralized Network				Decentralized Network			
	Denver	States and Wash., D.C.	Districts ESO and OCS	Totals	Denver	States and Wash., D.C.	Districts ESO and OCS	Totals
Central Processing Unit	1			1	1	11		13
System Printers (> 1000 LPM)	2			2	1	11		13
Magnetic Tape Drives	4			4	4	44		48
High Capacity Storage Device	1			1				
Medium Capacity Storage Devices	8			8	8	88		96
Card Reader and Punch	1			1	1	11		12
Medium Speed Printer (< 1000 LPM)	1			1	1	11		12
Local Terminal Control Unit	1			1	1	11		12
Local A/N Video Terminals	2			2	2	22		24
Local Video Hardcopy Device	1			1	2	22		24
Local A/N Keyboard Terminals	2			2	2	22		24
Local Full Graphic Terminals	2			2	2	22		24
Local Graphic Tablets	2			2	2	22		24
Communication Control Units	2	11		13	2	11		13
Terminal Control Units	2	11	66	79			66	66
Modems	12	12		24	12	12		24
Remote A/N Video Terminals	2	22	66	90			66	66
Remote Video Hardcopy Devices	2	22	66	90			66	66
Remote A/N Keyboard Terminals	2	22	66	90			66	66
Remote Full Graphic Terminals	2	22	66	90			66	66
Remote Graphic Tablets	2	22	66	90			66	66
BLM Transparency Scanner and Cartographic Printers	2			2	2			2
Estimate Total								

Figure 5. Equipment

Communications Controller Location			Terminal Controllers (Districts)
State Office Location	Alternate Location	Backup Controller Location (State)	Attached Terminal Control Units
Denver, Colorado	Denver, Colorado	1. Cheyenne, Wyoming 2. Salt Lake City, Utah	Craig, Colorado Grand Junction Montrose Canon City
Santa Fe, New Mexico	Santa Fe, New Mexico	1. Denver, Colorado 2. Cheyenne, Wyoming	Albuquerque, New Mexico Socorro Roswell Las Cruces New Orleans, Louisiana (OCS)
Phoenix, Arizona	Phoenix, Arizona	1. Santa Fe, New Mexico 2. Salt Lake City, Utah	Safford, Arizona Phoenix, Arizona Yuma, Arizona St. George, Utah
Sacramento, California	Folsom, California	1. Reno, Nevada 2. Phoenix, Arizona 3. Boise, Idaho	Riverside, California Los Angeles (OCS) Bakersfield Folsom Ukiah Redding Susanville
Reno, Nevada	Ely, Nevada	1. Salt Lake City, Utah 2. Boise, Idaho 3. Phoenix, Arizona	Winnemucca, Nevada Elko Battle Mountain Carson City Ely Las Vegas
Salt Lake City, Utah	Vernal, Utah	1. Cheyenne, Wyoming 2. Santa Fe, New Mexico	Salt Lake City, Utah Vernal Price Fillmore Richfield Cedar City Kanab Monticello
Anchorage, Alaska	Anchorage, Alaska	1. Portland, Oregon 2. Sacramento, California	Anchorage, Alaska Anchorage (OCS) Fairbanks, Alaska
Washington, D.C.	Washington, D.C.	1. Denver, Colorado 2. Cheyenne, Wyoming	Washington, D.C. (Hq. Off.) Silver Spring, Maryland (ESO) New York (OCS)
Cheyenne, Wyoming	Cheyenne, Wyoming	1. Denver, Colorado 2. Salt Lake City, Utah	Rock Springs Rawlins Casper Worland
Billings, Montana	Billings, Montana	1. Cheyenne, Wyoming 2. Denver, Colorado 3. Boise, Idaho	Dillon, Montana Billings, Montana Miles City Missoula Lewistown Malta
Boise, Idaho	Burley, Idaho	1. Salt Lake City, Utah 2. Cheyenne, Wyoming 3. Billings, Montana	Boise, Idaho Shoshone Burley Idaho Falls Salmon Coeur D'Alene
Portland, Oregon	Vale, Oregon	1. Boise, Idaho 2. Sacramento, California 3. Reno, Nevada	Vale, Oregon Burns Lakeview Baker Prineville Spokane, Washington Salem, Oregon Medform Coos Bay Roseburg Eugene
NOTES: "Alternate Locations" were selected based on proximity to Denver . . . an attempt to reduce line cost may be considered "Backup Controllers" would be used in the event of equipment or communications line failures Terminal control units also exist at the communications controller locations.			61 Districts 4 OCS 1 ESO 1 Wash., D.C., Hq. Off. 67

Figure 6. CC and TCU Distribution

5.1.2 Network Configuration

Figures 2 and 2A above represent a system approach which concentrates the major computing resources at a central location (the Denver Computer Center) with some distributed capabilities that extend to the district level. In considering the Bureau's requirements and the kinds of application programs that will address the functional requirements of BLM, it appears that this proposed system is best suited to meet the plans for implementation, growth, and maintenance. The amount of computing power relegated to the state and district offices is limited by the storage capacity of the selected controllers or mini-computers, the communication distances, and the terminals - both response time requirements and terminal capability. In essence, the "intelligent controllers" or "minis" at these levels (state and district) would be used to alleviate the CPU workload, to reduce the amount of computing time required to support the network, and to support the administrative details associated with telecommunications and terminal interactions.

At this point two separate controllers, with completely different capabilities are being considered. The communications controllers exist at the state level and at the Washington, D.C. office with an additional one at the Denver Computing Center for software development and maintenance. They are all attached to the host CPU in Denver via a communications trunk (see Figure 1, BLM Network in section 5.3) which may be either:

a. A 4800 Baud, half duplex, leased conditioned line in the minimal network (see figure 1, BLM Network in section 5.3) configuration or

b. A 9600 Baud, full duplex, leased, conditioned line in the recommended configuration or

c. A 50 Kilo Bit, satellite channel facility in the possible future system.

There are thirteen of these controllers which could be located at the following locations:

Denver, Colorado
(one at the state office facility and one at the computer center)

Sante Fe, New Mexico
Phoenix, Arizona
Sacramento, California
Reno, Nevada
Portland, Oregon
Boise, Idaho
Billings, Montana
Cheyenne, Wyoming
Salt Lake City, Utah
Anchorage, Alaska
Washington, D.C.

Other alternatives, of course, exists and a careful analysis of interstate and intrastate tariff rates would have to be considered prior to determining the optimal placement of these controllers. Figure 6 replicates the above list in terms of CC locations but it also includes a list of alternate locations which were chosen because of their proximity to Denver. This would further reduce the line costs. The actual location of these devices (controllers) will have to be determined on the basis of:

a. The internal considerations of BLM

b. A tariff analysis at the time of implementation

c. The kind of lines being used; dial-up, leased, half duplex, full duplex, etc.

d. The amount of intelligence in and support required for the CC.

Attached to these communication controllers, via a

a. Standard telephone lines in the case of the minimal system (2400 Baud, half duplex, dial up);

b. 4800 Baud, conditioned, leased line in the case of the recommended system (full or half duplex), or

c. 9600 Baud, conditioned, leased line in the case of the possible future system,

are all the terminal control units (TCU's) .... reference Figure 6. These TCU's are located in each of the district offices, the OCS offices, and the ESO in Silver Spring, Md. Currently configured

(but not optionally configured) based on the arguments presented above, each district office that reports to a state office would have its district TCU attached (via communication line) to the state CC. Each state CC would also have a TCU. The OCS office TCU in New York would communicate to the host via the Washington, D.C. CC as would the ESO office TCU in Maryland. The OCS office TCU in New Orleans would communicate to the host via the Santa Fe, New Mexico communication controller; the OCS office TCU in Los Angeles via the Sacramento CC; and the OCS office in Anchorage via the Anchorage CC.

In certain abnormal situations, it may be necessary to provide alternate paths (dial-up paths in the case of the minimal system and hardware switches in the case of the recommended and future systems) for the TCU. The failure of a communication controller should not prevent the associated districts from accessing the host CPU. Each hardware vendor may present his own solution to this situation either by providing duplicate devices (CC's) introducing alternate path devices and switches, and/or proposing duplicate line facilities.

Whereas the communications controllers perform functions that essentially deal with the operation of the network, the TCU's provide the interface with all the terminals attached to them. Such functions as sign-on authorization, message editing, transaction/request routing, code conversions, etc. are part of the normal administration associated with a terminal interface. Accomplishment of those functions at this level often prevents erroneous transmission of data or requests thereby decreasing communications traffic and relieving the CPU of these burdensome tasks.

The extent of this "off-line" activity; that is, not associated with or requiring host support, will be determined by the response time requirements of the system, the storage capability of the controllers selected, and the computing power of the communications controller and terminal control unit. There is also an obvious cost trade-off associated with this. Generally, the more expensive the selected device (controller), the more capability and capacity it has and vice-versa. Some determination will have to be made apropos the amount of intelligence and computing power that should be allocated to the state and district level configurations. That will be based on cost, response time requirements, down range software support requirements, storage requirements at each level, terminals supported at each location

(quantity and type), and the data integrity/system security requirements of the BLM.

The advantages of this kind of configuration must be viewed in light of current BLM operations and future growth plans. Considered below are some of the benefits of a centralized network with a limited distributed intelligence.

1. Concentrated software development and maintenance. With the probable exceptions of Alaska, BIFC, and Washington, D.C., each branch of the network (host to state to districts) will exhibit a high degree of similarity to the other branches. The only foreseeable deviation will be in the number of terminals ....a factor directly related to the amount of activity at each district office. In light of this parallelism in configuration, the majority of the software development and maintenance can be concentrated at the host location. Unless the kinds and levels of functional activities that will be performed at the state and district offices in the future necessitate the installation of small computers or minis, no on-site software development or maintenance would be required at those locations. All program development and loading will be initiated from the host CPU in Denver. Once the programs are transmitted from the host to the controllers, execution of those programs is initiated by any terminal transaction attached to that leg of the network. With this approach, all programmers reside at one location: Denver. All down-range software packages (controller programs) are maintained at the same level of operation.

2. Reduction in record storage duplication.

   A decentralized network often requires similar data and programs at each of the nodes or locations in the network. The disadvantages to this are readily apparent: (1) duplication of data requires more storage capacity which, of course, costs more, (2) maintenance of multiple copies of a program results in disparate release levels and communication confusions....elaborate program release and installation control procedures are time consuming and costly, (3) the release and installation of emendated versions of the software packages often requires an inordinate amount of system time, system management, and

network control....the failure of one installation (of a new software package) at a state office facility could cause the entire system, associated with that state office, to fail.

Conversely, the advantages of a centralized network are (1) a single data base and (2) a single set of programs. All the data and software for the system is maintained at Denver. There is only one copy to maintain and the storage requirements are significantly less than in a decentralized configuration.

3. Maximum utilization of resources.

The concentration of development and maintenance activities in Denver results in a more efficient use of personnel. Systems analysts, computer programmers, computer specialists, computer technicians, computer operator, and keypunch operators can be more effectively used, fewer people are required. In a decentralized network duplication of this support group may be required at each location.

5.1.3 Communication Controller Software

The communication controller (CC) in this (a centralized) network could exist at the state level. It would have full transmission control capability in support of data to and from the host CPU as well as to and from the terminal control units (TCU) installed at the district offices. This controller should contain some measure of processing capability and some range of core storage (or direct access storage facilities on some storage medium, i.e., a disk, etc.) commensurate with system demands. How many TCU's will be attached to the controller? How fast will the data be transmitted over the communications lines? How much data will be entering and leaving the CC? How much network teleprocessing will have to be done at the CC? These are questions which can be answered when the details of the system design take place and the vendor(s) for each piece of equipment in the network is or are selected. The terminals and TCU's as well as the CPU selected will help to determine the optimum configuration. Data rates or line speeds (number of characters transmitted over a telephone line or

communications trunk in a given length of time) are directly related to network activity and the number of terminals attached to the system. It is conceivable, at the present time, that at least 2400 Baud (2400 bits per second) lines will be required from the TCU"s to the CC"s with probably twice or four times that speed from the CC to the CPU. The movement from hard wired, fixed application communication control units to semi-intelligent, programmable boxes seems to have been the trend in recent years. A control program, down range loaded from the host computer, residing in the control unit storage now performs many of the functions previously performed by the central processing unit. The assumption of these functions by the controller increases the availability of the CPU to process other programs and to perform more involved message-processing and data processing functions.

Programmable communications controllers now perform, under program control, the functions previously performed by the transmission control units. This included such functions as line control, character recognition, line time-out, character assembly and disassembly, and redundancy checking. In addition, these controllers can be programmed to (1) handle all polling and addressing of communications lines to determine if a line is ready to send or receive data, (2) take over data link control, (3) add and delete framing characters to the beginning and end of blocks of data, (4) translate from line code into code recognizable to a message-processing program (and vice-versa), (5) perform extensive error recovery, retransmission of data, and logging of error activity, and (6) provide dynamic buffering for incoming data and basic message switching/message processing functions.

It appears, at the present time, that most state/district configurations will be similar. A few exceptions may evolve, or already exist, that would preclude exact duplications of each leg of the network. Certainly, any attachment to the Boise Interagency Fire Center will require some computer to computer attachment considerations. While this is possible and has been done numerous times in the Federal Government; e.g., the Veterans Administration, the complexities associated with this "tie-up" always necessitate a careful analysis of the control systems involved, the planned or installed data communications facility, and the hardware.

In addition to BIFC, the future computing requirements and the distances involved when considering the Alaskan State Office and the Washington, D.C. Office, may require the installation of

independent computing facilities at each of these locations. Much as the case with BIFC, a computer to computer interface will have to be established to complete the network to those two locations.

A constant and careful analysis of the application requirements, the communication line requirements, and any communication problems will have to be made to affect the necessary changes to the attachments and configurations of these two offices. Current indications are that the recommended configuration can well handle the activities and communication requirements; however, any installation should not preclude the future escalation of computing power at these two locations.

5.1.4 District Level Terminal Control Units

The district terminal control units (TCU's) in the proposed configuration should also be programmable, should be independent from the terminals (kind and quantity) they support, and should be down range loadable from the host CPU via the communication controllers. The feasibility of a stand alone (disconnected from the CPU) operation should also be considered.

Through some special code* (1) , application software modules, and access methods residing in the TCU, the following devices and attachments should be supported:

1. A graphic terminal* (2) (preferably a storage tube display or a raster (T.V. type) scan display) with full vectoring capability...and length vector in any direction,

2. The graphic terminal should also include an ability to display text (alphanumeric as well as special symbols), an ability to point to data with a light pen* (3) or tracking ball/cursor for identification purposes, an alphanumeric keyboard, and a function type keyboard* (4) to enter special requests with a simple one-button push action from the operator,

3. A graphic tablet with all necessary attachments to the graphic terminal,

4. An alphanumeric keyboard terminal which can function as an interactive terminal but can also be used as a hard copy device to request the output of small reports or single page hard copies of information,

5. A hard copy device - A or printer - A with enough speed to be able to retrieve data, such as a large document, in a reasonable period of time.

The number and combinations of terminals at a state or district office may differ slightly but current estimates seem to indicate the following (reference Figure 6 of Section 5.2).

a. At the district level, one type of each of the five terminals listed above,

b. At the OCS and ESO offices, one type of each of the five terminals listed above,

c. At the state level, two copies of each of the five terminals listed above,

d. At the computing center in Denver, two copies of each of the terminals listed above except the printer (hard copy device), only one of those would be required.

The types of terminals ultimately selected may require some special device adapters and a user coded access method to provide software access (within the TCU) to that particular terminal. Many vendors provide some of these features as part of their terminal support but, usually, access methods and adapters are aimed at the CPU level and not at the TCU level. The Bureau should carefully consider the entire configuration, i.e., each terminal should be attachable both hardwarewise and softwarewise. The interface between one hardware vendor's terminal and another's TCU may not be possible without extensive hardware re-design. It may well be the case that software access methods are not available but most vendors are quite willing to consider appropriate hardware and software development at additional cost.

These terminal controllers should allow for attachment of or include some direct access storage capability, some core storage, some high speed input device (card reader, paper tape reader, etc.) and some hard copy device as well as the terminal aforementioned.

Software capabilities that might be included are as follows:

a. FULL GRAPHIC TERMINAL SUPPORT

1. Terminal access method
2. Keyboard, light pen support
3. Formatting capability

(a) Addressing
(b) Vectoring
(c) Text

4. Selectable display areas
5. Protect/unprotect features

(a) Screen areas
(b) Text
(c) Symbols
(d) Vectors

6. Area identification for input and output

b. ALPHANUMERIC VIDEO TERMINAL SUPPORT

1. Terminal access method
2. Keyboard, light pen support
3. Formatting capability

(a) Addressing
(b) Field definition

4. Selectable display areas
5. Protect/unprotect features

(a) Field
(b) Characters

c. GRAPHIC TABLET SUPPORT

1. Reading input data
2. Routing data from the tablet to the full graphic terminal
3. Point identification

d. GENERAL CONTROL PROGRAM

1. Task handler
2. Data manager
3. Terminal support
4. Graphic support package
5. Direct access storage device support
6. Priority handler
7. Application program handler
8. Telecommunication interface
9. Terminal sign-on/sign-off authorization capability
10. Auto-dial feature
11. Transaction logging capability

While all these features may not be necessary, they should be considered as development options in the overall design of the system.

* (1) Special code: the kind of programs developed in the CPU for the environment is intended to pre-set the functions performed by the hardware and is generally not modifiable at the TCU level. It must be coded or recoded at the host CPU and transmitted to the TCU via the telecommunications facilities.

* (2) Full graphic terminals: terminals with full vectoring capability ...horizontal, vertical, diagonal. These terminals should also have full screen addressing and alphanumeric display capability.

* (3) Light pen: a device used with a video terminal to enable the operator to point to something on the video screen and generate a message to the TCU that the pointed data is being addressed by the terminal operator.

* (4) Function keyboard: as opposed to an alphanumeric keyboard. The function keyboard contains several pushbutton type keys, which when depressed, will generate a message to the TCU. The message will contain a key number and the programs are pre-set to interpret that key number as a request to perform a given function, e.g., "display the next page please."

5.1.5 The Denver Computer Center

The Denver Computer Center (reference Figure 12 of the Software Section) will, of course, require the computing power and storage necessary to support the requirements of the Bureau, the Control System, the Data Communication Management package, the Data Base Management package, all the Application programs or packages, and the data base attendant thereto. Figure 5 of this section lists the kinds and quantities of equipment currently envisioned for BLM. It is anticipated that all programs and all working storage space will reside on so some fast, low capacity direct access storage device such as a disk. The high capacity, slow access device should be used as bulk storage for that data that is not often accessed and that data that requires an inordinate amount of storage space. A good example of this would be the currently used planning unit transparencies which, when scanned at 2 mils, requires about 28.5 million bytes of storage. Of course, this data can be compressed, or modified to render vectorized representations of the original image. Nonetheless, the original effort required a lot of storage and the time required to access it (the transparency) in this form is not as important as the on-line interactions taking place between terminal operators at the district and the CPU in Denver. For these reasons, a high capacity, slow access device best suits the application. Magnetic tapes would be the other alternative but they are too slow and they require computer operator intervention and a tape library, etc. It becomes inconvenient and costly.

5.2 SYSTEM SOFTWARE

5.2.1 Control System

The major computing center in the proposed centralized network will exist at Denver. A data processing installation of this type exists for one main purpose: to do work. In order to fulfill this purpose economically and efficiently, all the installation's machine facilities must be kept as busy as possible. A control system must be established (developed or purchased) to increase the productivity of the Denver installation. This control system achieves its purpose by managing the allocation and use of all the available resources, including the central processing unit, main storage, the input and output devices, the network controllers and any software packages (programs) that are in, or part of, the system.

The large volume of work that the Denver computer will have to do cannot be executed simultaneously, simply because it would mot be economically wise to have all those required resources available at one time. In the current terminology of the multiprocessing world, the work load is sub-divided into "jobs." When the computer is given a "job" to accomplish, two things generally happen: (1) the resources needed to perform that job are allocated by the control system and (2) the job becomes a task or a set of tasks to be accomplished. In the proposed facility for BLM in Denver the CPU should, under the supervision of the control system, be able to execute a variable number of these tasks at the same time.

In order to be effective, the control system installed by BLM should be general enough to accommodate the wide range of application requirements and the hardware configuration currently envisioned. It should include an extensive library (of support routines and programs) that can be tailored to the presently planned installation as well as cope with future growth. In this way, the control program, the programs written specifically for BLM, and the purchased or added system programs for data management and data communications facilities are molded into one functionally operating system in order to meet BLM's data processing needs.

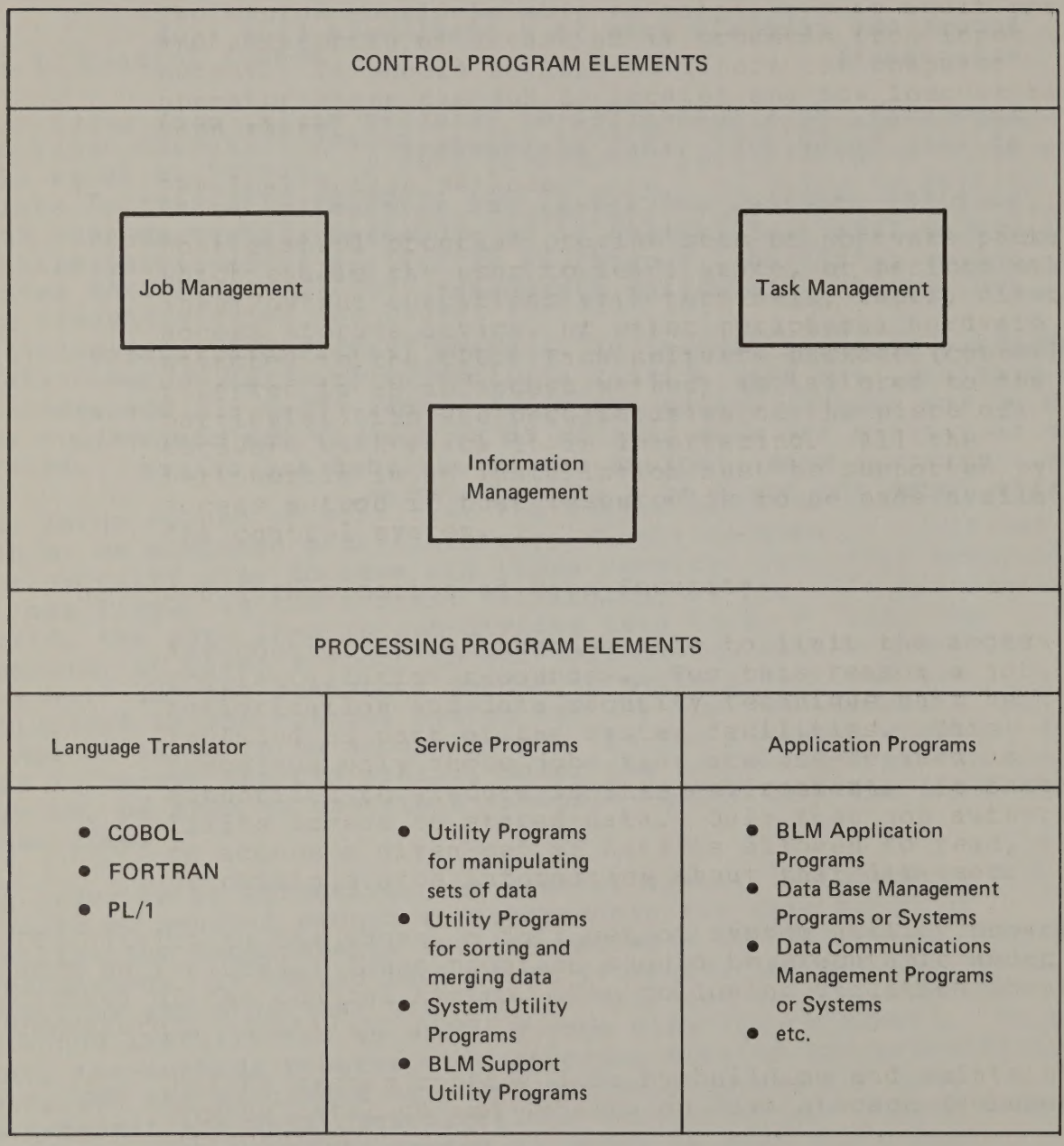
The programs that compose the control system can be classified as (1) a control program and (2) processing programs. The three main functions of the control program are:

a. Accept and schedule jobs in a continuous flow (job management)

b. Supervise, on a sequential or priority basis, each unit of work to be done (task management)

c. Simplify storage, retrieval, and maintenance of all system data (information to be processed and/or stored and/or retrieved), regardless of the way it is organized and stored (information management)

The processing programs consist of language translators, system service programs, and user written application programs. The elements of the control system are shown below. They all operate together to perform the work that is to be done by the computing facility. Although some programs may be excluded and others added, this forms the basis of a control system.


CONTROL PROGRAM ELEMENTS
Job Management
Task Management
Information Management
PROCESSING PROGRAM ELEMENTS
Language Translator
Service Programs
Application Programs
• COBOL
• FORTRAN
• PL/1
• Utility Programs for manipulating sets of data
• Utility Programs for sorting and merging data
• System Utility Programs
• BLM Support Utility Programs
• BLM Application Programs
• Data Base Management Programs or Systems
• Data Communications Management Programs or Systems
• etc.

The system required to perform the various jobs of the Bureau is infinitely more complicated than the one described above. That control system should include the following capabilities:

a. System Configuration

In order for a control system to be able to allocate and manage resources, it must know what configuration it has to work with. If we assume that the control system is not coded by the user and tailored specifically for an installation (which is generally the case), then the tailoring of a control system to a configuration is done at system generation time. One of the requirements of a control system, therefore, is the ability to generate a control system capable of detailing the configuration of the installation and regenerating it if the installation grows and modifies the resources available.

b. Job Entry and Output

This requirement includes the ability to accept jobs from some input device (punched cards, tape, disk, etc.) and schedule the job steps for execution, on either a priority or sequential basis. In addition, the control system should be able to handle the termination of a job step and the resultant output to some appropriate output device; e.g., the printer.

c. Automatic Task Initiation

There are times when a unit of work (a task) must be started on a timed basis or as a result of some internal triggering facility. This facility should be a function of the control system.

d. System Checkpoint/Restart

The system should be able to periodically checkpoint itself...what jobs are executing?, which are in input queue?, which in the output queue?, etc. In the case where some system failure occurs, the control program (with some interaction with the computer operator) should be able to restore itself to the last valid checkpoint and continue to function with a minimal loss of work, computer time, etc.

e. Performance Monitoring/Tracing

The system should be able to maintain some audit trail and monitoring of a task as it proceeds from input to output. It should be able to inform the computer operator where the job is located and how long it has been there.

f. Physical Access Methods

Most control programs provide sets of software packages which enable the user to read, write, or perform other input/output operations with terminals, tapes, direct access storage device, or other peripheral hardware attached to the CPU. Each software package (commonly referred to as an access method) is tailored to the particularities and peculiarities of the piece of hardware with which it is interfacing. All the peripherals in an installation must be supported by an access method if that resource is to be made available to the control system.

q. Job Authorization ad Data Security

Any control system must be able to limit the access to the installation resources. For this reason a job authorization and data security technique must be included as part of the system facilities. This processes only those jobs that are pre-defined as authorized to execute in this environment. It further limits access to stored data. Only that job authorized to access a given set of data is allowed to read, write, or obtain status information about that data set.

In addition to the above, a full set of system utility programs must be included. These programs should be executable under control of the control system. The following utilities should be considered. A utility program to:

a. Modify system control data by building and maintaining system catalogs and details on data storage (volume) structures.

b. Move, erase, and copy collections of or individual sets of data to rearrange them, remove them, or create backup copies.

c. List the system control data, such as a Catalog, or a directory, or a volume table of contents.

d. Retrieve, edit, and write previously generated records and sets of data.

e. Initialize (with control information), dump and restore the data contents of a selected direct access storage device, and

f. Compress and merge sets of data so as to avoid large areas of unused storage in direct access storage facilities.

Finally, the control system or a comparable system (which can be generated and executed separately) must contain a full set of hardware diagnostic programs. Each of these programs should be independently or group selectable by an operator and each should be able to test the functional capability of a piece of equipment or a communication line. These programs are intended to assure an operational hardware configuration and to help the computer technician locate a problem in order to effect the necessary repairs.

5.2.2 Data Base/Data Communication

5.2.2.1 DB/DC Systems

In addition to a control system, extensive software must be included to support the teleprocessing (TP) facility of the BLM system. A wide range of TP applications can be installed utilizing an appropriately purchased or leased data communication system with some comparably supported data management support. This kind of system provides the control, language, communication, and data handling facility usually found in most teleprocessing supervisory systems or file managers. It substantially reduces the systems programming cost traditionally associated with

teleprocessing or data base implementation, by eliminating the investment needed for system development and maintenance.

A data base/data communication system supports teleprocessing applications based on transactions and on-line data storage. In that capacity it looks very much like an extension to a control system. It performs for teleprocessing operations what control systems generally do for traditional batch (without some operator intervention) processing. All terminal operators in the BLM network will be using the data communications facility and the associated data management programs.

A data base/data communication (DB/DC) transaction is what results when somebody uses a terminal to help them get their work done. It is very application oriented: querying a data set on the status of grazing permits for a specifed geographic area, modifying a document print prior to publication, recording the results of a timber sale; are all examples of transactions which could be initiated and processed through the BLM terminals. (See Figure 1.)

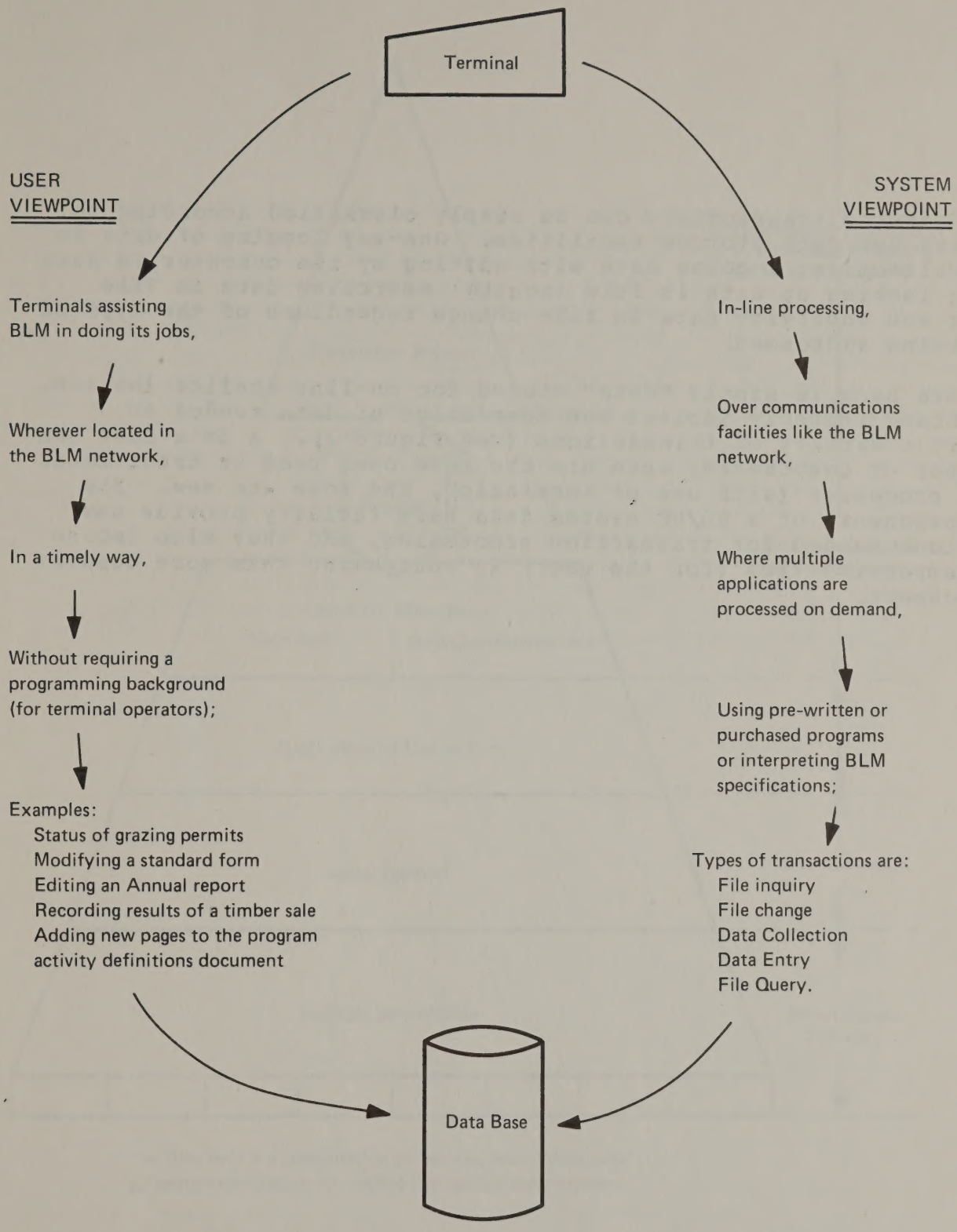
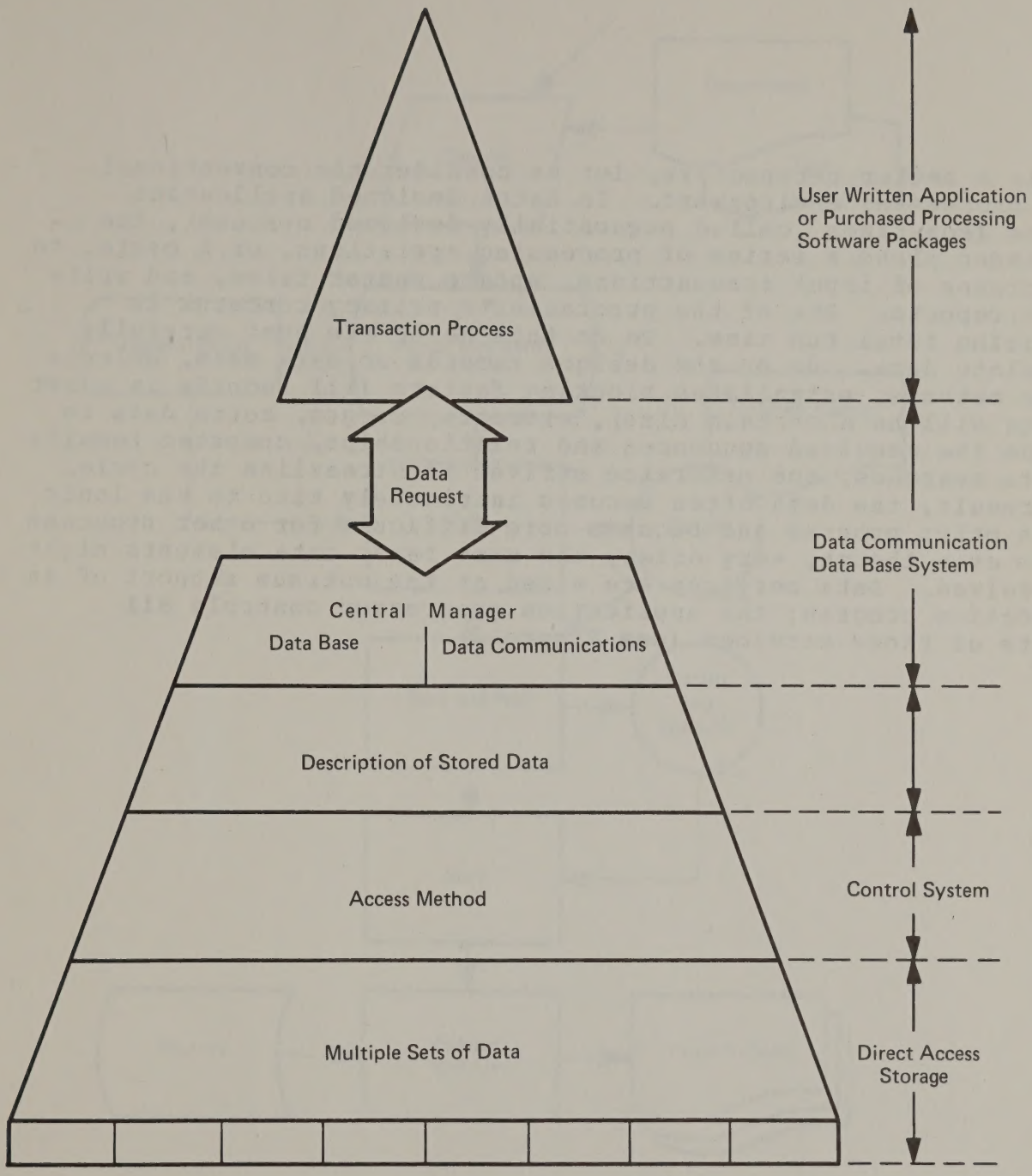

Terminal
USER VIEWPOINT
SYSTEM VIEWPOINT
Terminals assisting BLM in doing its jobs,
Wherever located in the BLM network,
In a timely way,
Without requiring a programming background (for terminal operators);
Examples:
Status of grazing permits
Modifying a standard form
Editing an Annual report
Recording results of a timber sale
Adding new pages to the program activity definitions document
In-line processing,
Over communications facilities like the BLM network,
Where multiple applications are processed on demand,
Using pre-written or purchased programs or interpreting BLM specifications;
Types of transactions are:
File inquiry
File change
Data Collection
Data Entry
File Query.
Data Base

Figure 1. Transaction Processing

These diverse transactions can be simply classified according to how they use data storage facilities. One-way logging of data is data collection; logging data with editing by the computer is data entry; looking up data is file inquiry; searching data is file query; and modifying data is file change regardless of the type of data being addressed.

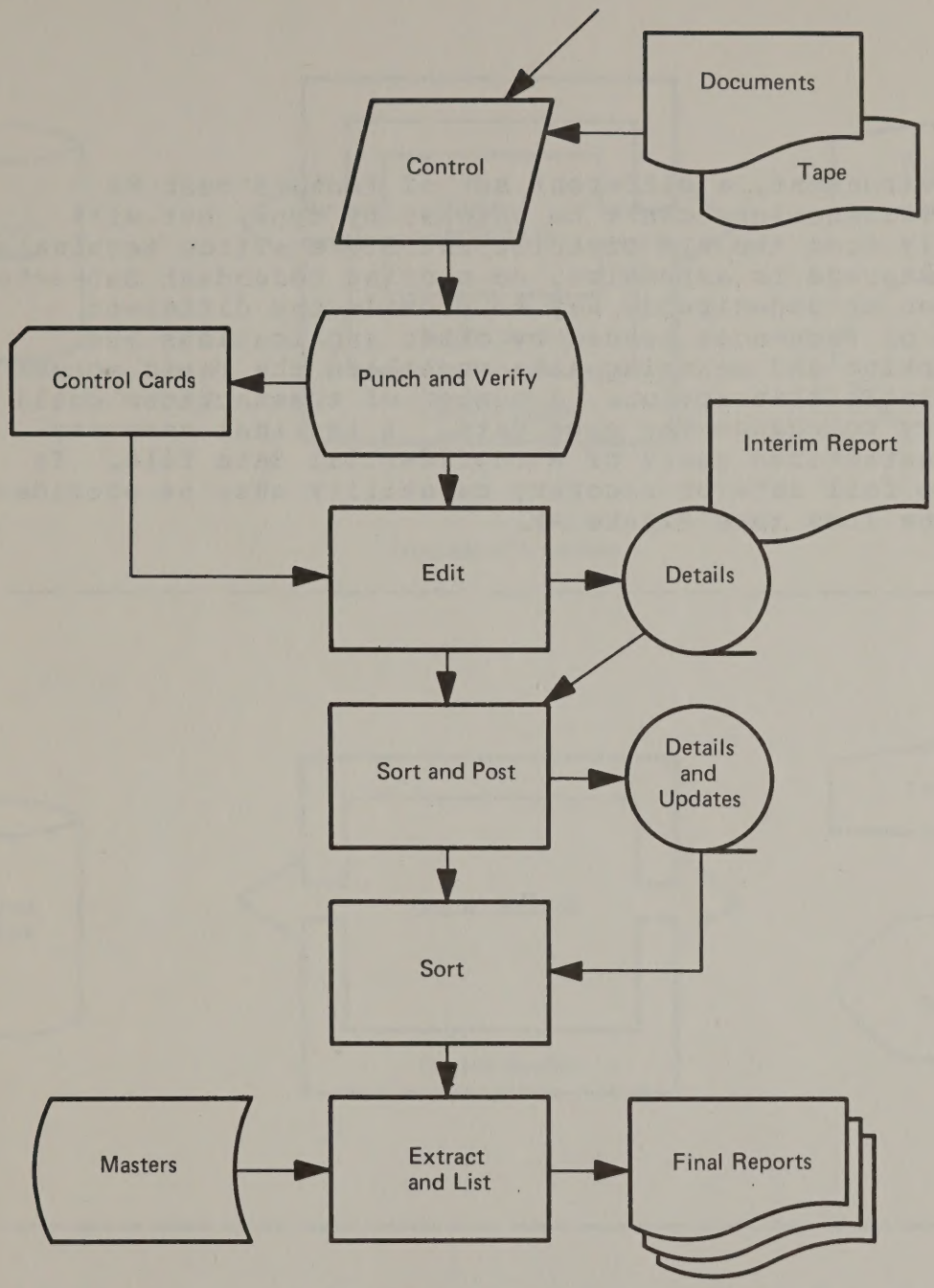
The data base is simply "data" stored for on-line application use. The phrase properly implies the foundation of data needed to support a variety of transactions (see Figure 2). A data base has a number of components; some are the same ones used in traditional batch processes (with use of terminals), and some are new. The new components of a DB/DC system data base facility provide new functions needed for transaction processing, and they also impose new responsiblities (for the user) in addressing this more complex environment.



The data base is a combination of devices, sets of data, and software organized to service the transaction environment.

Figure 2. The Data Base

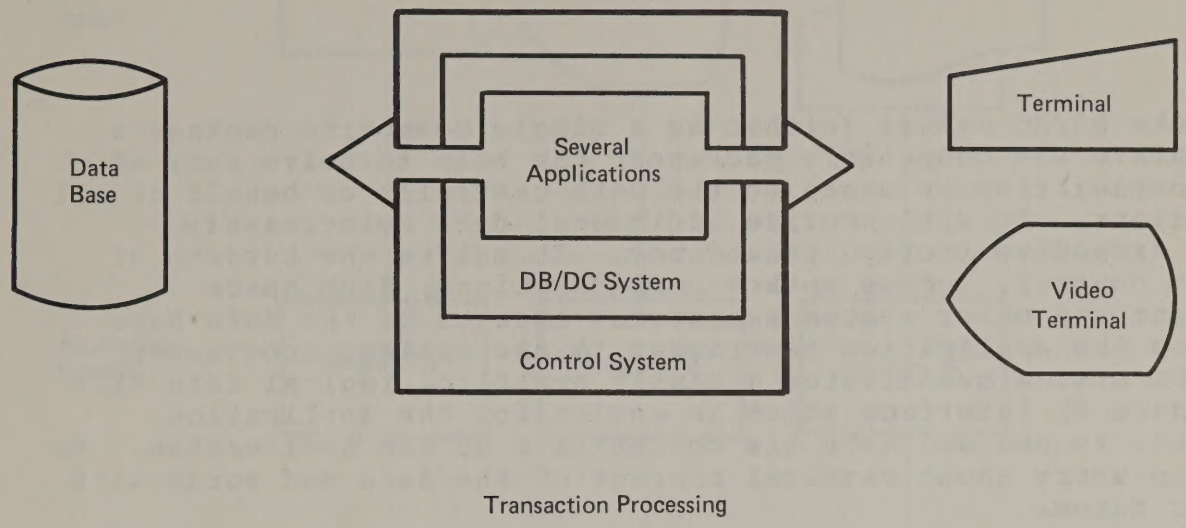
To gain a better perspective, let us consider the conventional batch processing environment. In batch designed application systems (sometimes called sequentially designed systems), the programmer plans a series of processing operations, or a cycle, to edit groups of input transactions, update master files, and write output reports. One of the programmer's primary concerns is optimizing total run time. To do this, he or she must carefully manipulate data. He or she designs records or data sets, selects access methods, establishes blocking factors (all records in a set of data will be a certain size), extracts, merges, sorts data to provide the required sequences and relationships, computes results of data searches, and otherwise strives to streamline the cycle. As a result, the data often becomes intricately tied to the logic of his other program and becomes more difficult for other programs to use even though, very often, the same basic data elements might be involved. Data services are aimed at the optimum support of an application program; the application programmer controls all aspects of those services (see Figure 3).



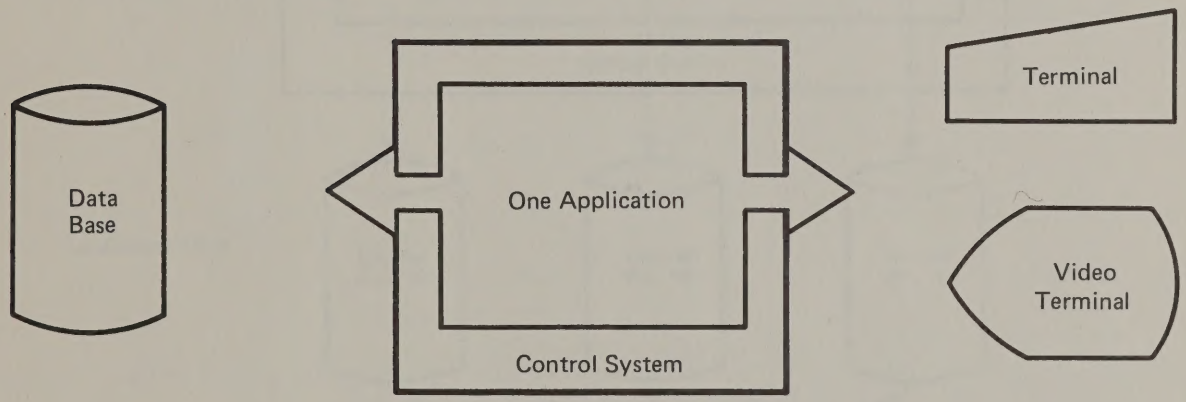
With the traditional batch approach, data storage is usually tailored to the specific programs of the application and is privately owned by that program.

Figure 3. Conventional Batch Processing

In a DB/DC environment, a different set of factors must be considered. Transactions can't be batched by type, but will arrive randomly from the BLM District and State office terminals. On-line data storage is expensive, so storing redundant sub-sets of data becomes an undesirable way to provide the different relationships or sequences needed by other applications and programs. Sorting and scanning data prohibits the rapid access needed by a single transaction. A number of transactions could conceivably try to change the same data. A terminal user may attempt an unauthorized query of a confidential data file. In addition, some fail safe or recovery capability must be provided to prevent data loss (see Figure 4).



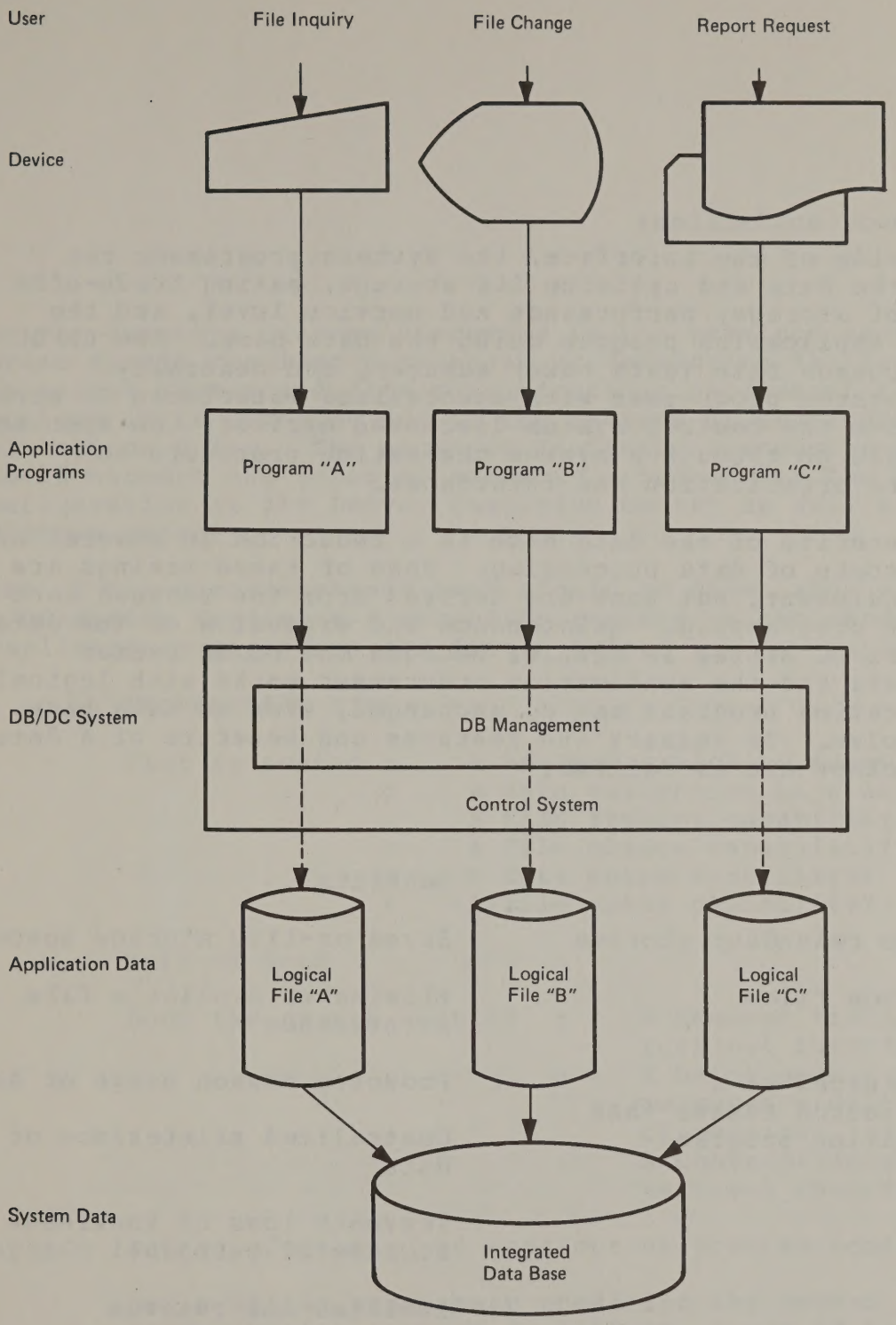
Transaction Processing



A DB/DC system controls many random transactions using a data base which supports each application with integrated data. In contrast, a batch processing system schedules each application independently, and provides data support unique to each application.

Figure 4. Data Base Concept I

A complete DB/DC system (either as a single composite package or two separate but compatible packages) can help to solve many of these complexities by managing the data centrally on behalf of all applications. It will provide additional data relationships without excessive storage redundancy. It shifts the burdens of data set control, access method considerations, disk space management and other system management aspects of the data base away from the application programmer to the systems programmer. The DB/DC system substitutes a highly symbolic, logical data file (see Figure 5) interface which is easier for the application programmer to use and lets him concentrate on the application. He ceases to worry about physical storage of the data and words with symbolic names.



The data base supports each application's information needs independently and concurrently, hiding the actual complexities involved from the application programs.

Figure 5. Data Base Concept II

On the other side of the interface, the systems programmer can organize all the data and optimize its storage, making trade-offs between cost of storage, performance and service level, and the needs of each application program using the data base. The DB/DC system has a common file (data base) manager, and generally provides the system programmer with specialized interfaces to work with. Much like the control system discussed earlier, the systems programmer would go through a system generation procedure to define the data organization and interfaces.

The primary benefits of the data base is a reduction in several of the standard costs of data processing. Some of these savings are realized in equipment, but most are derived from the reduced cost of application programming. Maintenance and expansion of the data base under a DB/DC system is simpler because the DB/DC system manages the data and the application programmer works with logical files. Application programs may go unchanged, even as data base components evolve. In summary the features and benefits of a data management package are as follows:

Features	Benefits
o Eliminates redundant storage	Saves on-line storage space
o Consolidates files	Eliminates duplicate file maintenance
o Data is managed as a system resource rather than an application program resource	Promotes common usage of data
	Centralized maintenance of data
	Prevents loss of knowledge because of personnel change
	Isolates and removes complexity from the application programmer
	Eliminates reprogramming due to data changes
	Allows for easier

application program changes.

For the numerous reasons discussed in the previous sections, the Bureau should consider purchasing or developing its own data base management system and data communications management facility. Purchase is recommended due to the savings in development and maintenance costs. The packages (software systems) considered should support the types of hardware proposed for the BLM configuration at the Denver Computing Center as well as the selected network.

Some of the considerations that should be given when selecting a DB/DC system (again as a composite package or two separate but complimentary packages) are listed below:

a. Transaction type

What is needed : A message switching capability?
: A data collection capability?
: A file inquiry capability?
: A file change capability?
: A data entry capability?
: A file entry capability?

b. Unit of Work

Does the system require : A message transaction kind of terminal interface?
: A batch message (several messages simultaneously) kind of terminal interface?
: A conversational kind of terminal interface?

c. Method of system and application program control

Can a system programmer predefine the system configuration such as facilities, types of terminals, types of communication lines, data base structure, and data base use?

Can this predefined system be dynamically modified?

Must terminal operators sign on and off the system? Are there passwords? Is the system under control of a supervisory terminal?

Can the system control which programmers and which operators have access to particular sections of the integrated data base?

d. Devices

What kinds and types of equipment does the DB/DC system support

Are computer-to-computer interfaces supported and what kinds?

What line speeds are supported in the TP environment

Are there maximum capacities?

e. User Interfaces

Can the application programmer write his programs in COBOL? PL/I? FORTRAN? etc.?

What kinds of terminal commands are supported (user identification, operator control commands, statistics gathering commands?)

What kinds of system tables are available to the user and application programmer?

What kinds of utilities are available to help the application programmer (table listings, print dumps, system generation, tracing dumps, daily statistics of system activity?)

f. Programming Aids

What kind of editing capability does the system have to help the system programmer, the terminal operator, and the application programmer?

What kind of testing facilities are provided (terminal simulators, core dumps, error indicators, etc.?)

g. Data Management

How complex can the data base be structured? Can records be fixed or variable lengths or both? What kind of indexing is provided? How many levels of indexing are supported?

What are the accessing techniques supported? Random? Sequential? First request in, first out? Last request in, first out? Priority?

How easily can the data base be updated? Can it be done off-line?

What kind of data integrity scheme is supported?

What kind of data security is supported? Can transactions to and from the data base be logged?

h. Operational Characteristics

How does one start-up, shut down, and restart the system?

What kind of data recovery capability is provided if the system fails?

What kind of error recovery capability is available in case of terminal failure, TP failure, or data base I/O failure?

What kind of response time can the system provide for the terminal?

How detailed are the statistical files and the available statistics for the system prograamer?

How detailed is the log of system activities?

i. Implementation

Under what control system does it execute?

Are there any configuration (hardware and software) limitations?

What access methods will the system use?

What kind of program management does it have....does it have a local library for overlapped loading?

What kind of storage management does it provide.....do programs have to remain core resident during transaction activity? Between transactions?

What other programs (purchaseable) will execute as application programs under this DB/DC system?

As stated earlier, these are but considerations. The installed data base management facility must, first of all, meet the data base requirements of the Bureau. Generally, the more complex the system (purchased or programmed), the more it will cost. The data base currently envisioned for BLM will not only be large but will require significant cross-referencing and complicated manipulations. It is therefore incumbent upon the Bureau to consider a data base management system with extensive capabilities. This would include:

a. Extensive file description tables

b. Fixed and variable length records with record segmentation capability

c. Multiple level record structures with numerous integrated record types

d. Multiple indexing levels

e. Full on-line change capability (insert, update, delete)

f. Full off-line change capability (define, load, insert, update, delete)

g. An extensive security system to protect the data base and limit access to authorized users

h. An adequate range of statistical information such as: number of accesses to the data, number of queries, number of changes, source of query, source of change, etc.

On the data communications side of this support subsystem, all considerations are directly associated with the network and the supported terminal facilities. The installed data communications program must support the communications speeds and the terminals attached to the BLM configuration. As designed and discussed in the hardware section of this document, the anticipated line speeds (speed of the data over the communication lines from the state offices to the Denver Computing Center) will be 9600 Baud (9600 bits per second) in the minimal system and 50KB (50,000 bits per second) in the recommended system.

The following requirements should be considered based on the proposed system.

a. The anticipated telecommunications features should include:

   1. Message switching (i.e., transmitting messages from the terminal at one district office to an addressed terminal somewhere in the BLM network)

   2. Message broadcasting (i.e., transmitting a message from a supervisory terminal to all the active terminals in the network

   3. Data collection (logging data as entered by the terminal)

   4. File inquiry (looking up data)

   5. File change (modifying the data in a file)

   6. Data entry (logging data with editing by the computer)

   7. File query (searching for data).

b. The "unit of work" from the network (one or several terminals) to the CPU will be one of the following:

   1. A simple message routed in or out of the CPU

   2. A batch of messages entered or received from the CPU

3. An on-going conversation between the operator at a terminal and the CPU

c. The devices support by a data communications program should include:

1. At least 43 communications controllers over high speed conditioned lines (9600 Baud minimal system and 50KB recommended system)

2. At least one local TCU with all its attached terminals, graphic tablet, and hard copy device.

Additionally, any data base management and data communications management packages installed at Denver should have a full checkpoint/restart capability, an extensive system logging capability, some user interface support for the application programmers such as COBOL and PL/I, and should execute on the selected computer facility.

5.2.2.2 BLM Data Base Organization

The data base management system will provide access to reports and information that were previously unavailable. The system will be able to maintain and manipulate the large volume of data envisioned to be required by BLM and possesses a large growth potential. For information which requires confidentiality such as personnel and archeological site data, the system will limit access to those who have been authorized to use the information. The system will be designed to be flexible enough to take advantage of technological innovations and permit easy reorganization of hardware, programs, data sets and processing functions.

The specific capabilities of the data base manager that will provide these functions are:

a. Hierarchy structure

b. Non-redundancy of data

c. Device independence

d. Operational modes

e. Security

f. Data base integrity.

5.2.2.2.1 Hierarchy Structure

Each of the identified data sets contain one or more logical records that contain the data needed by BLM. The vegetative data set, for instance, contains plant, plot/transect, vegetative type/ecotype, tree, plot and forest type logical records. These logical records have inherent logical hierarchical relationships that must be maintained in any data base system. For example, the vegetative data set has two types of data hierarchies. Timber vegetation has a descending hierarchy relationship of forest type, plot and tree logical records. Forage vegetation has a descending hierarchical relationship of vegetative type/ecotype, plot/transect and plant logical records. That is, the forest type record, in addition to its own descriptive information, must be able to identify and associate with the plots of which it is composed. The plot record in turn must be able to identify and associate with the tree records within its composition. And the tree record, which is the smallest descriptive logical record in the timber hierarchy, will contain individual tree data. The same descending hierarchical relationships exists for forage vegetation.

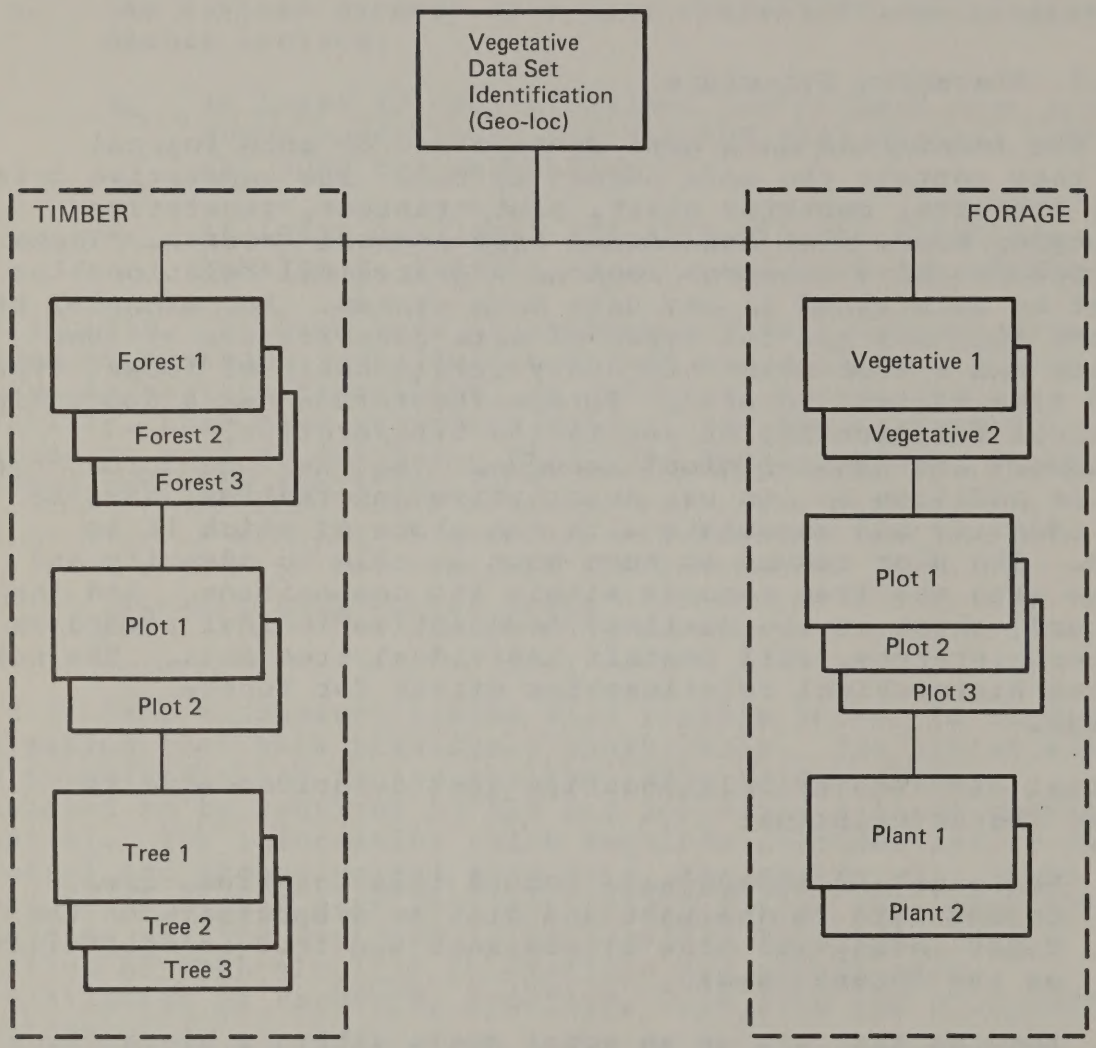
The logical hierarchary relationships just described have the following characteristics:

a. Dominant and subordinate record relationships, i.e., forest type is dominant and plot is subordinate on the first level, and plot is dominant and tree is subordinate on the second level.

b. Records that are on an equal scale within a hierarchical level, i.e., all the tree records in a plot.

c. Records that are on an equal level in different hierarchies, i.e., the tree records and plant records.

The following illustration depicts this hierarchical relationship using the vegetative hierarchy as an example.



Hierachy Relationship Example

5.2.2.2.2 Non-redundancy of Data

The data sets within the overall BLM data base must be capable of communicating with each other. When one data set contains information used in other application areas, the information should be stored in one place within the system and referenced by the various user-application programs. This method eliminates data redundancy by establishing interrelated data sets. For example, various resource inventory data are used by many application areas, i.e., URA, Case Management, Protection and EAR/EIS. To store this information in each application area data sets would decrease efficiency of storage facility utilization and complicate the design and implementation of the application programs. In most cases, the data base manager provides for one-time physical storage of each separate data element defined to the system.

5.2.2.2.3 Device Independence

To minimize descriptions to system operations as the data base evolves and grows, the data base management system will support a variety of storage devices. The storage device, whether it is magnetic or paper tape, disk, drum or cartridge will be given a symbolic identifier. The programmer will always refer to this identifier, so that changing storage devices will usually not impact existing programs.

The data can be stored using sequential or direct organization. The primary difference between the direct and sequential organization is the manner in which the data is physically related and the techniques of accessing the data. The logical view of the data is the same regardless of which access technique is used. Therefore, the organization of the data base can change as usage demands without effecting existing programs.

5.2.2.2.4 Operational Modes

BLM is currently supported by a batch-only system. The system will evolve to include locally-entered batch, remotely-entered batch and interactive online processing. To assist in this evolution and to ensure smooth operations when the system is implemented, the data base manager will provide for:

a. Non-critical local or remote batch updates of data sets, e.g., updating the textual data set with technical literature abstracts.

b. Non-critical local or remote retrieval and display of the data in data sets, e.g., production of program progress reports.

c. Interactive online updates of data in the data sets, e.g., recording application information as it is received.

d. Interactive online retrieval and display of the data in the data sets, e.g., interrograting the land records data set to determine the status of the land.

5.2.2.2.5 Security

Certain terminals within the BLM system will only be able to read and display specific kinds of data, e.g., the public room terminal should only be allowed to retrieve and display land records data, some resources data and possibly FIS abstracts. Data such as payroll, planning personnel, cultural resource and case should not be made available. The public room terminals should not be allowed to update any of the data sets.

Only selected individuals on selected terminals should be allowed to update each data set. For instance, the timekeeper or supervisor may be the only person allowed to enter the time and attendance information into the M&O data set.

All network terminals should be controlled by a master terminal that has the ability to reassign the function of a terminal, e.g., change the terminal from a read-only to an update terminal or stop any or all terminal requests against a data base. This is necessary because the assigned update terminal may become inoperative and, in order for the data base to remain current, another terminal may need to be reassigned to perform the update function.

5.2.2.2.6 Data Base Integrity

A major objective of the installation of a data management system is to improve the productivity of the programmers by providing an

efficient, easy to use tool with which to accomplish the required tasks. The system should support a variety of programming languages and provide rapid update and query processing using indexes.

The data base management system will not allow simultaneous updates of a data set nor can data be retrieved from a data set until an update is completed. For example, if the vegetative data base's forest type record was being updated and simultameously, data was being requested, the update should be allowed to be completed so that the latest information would be available to the requester.

5.2.2.3 BLM Data Set Attributes

Table 5-1 contains a list of the data sets and their attributes. The attributes consist of:

a. File size - of a data set is measured in terms of the number of logical records

b. Logical record:

   1. Type - the broad description of the data elements within a data set

   2. Length - the approximate length in bytes of each type of logical record.

c. Currency - an indication of how recent the data must be

d. Volume/Frequency:

   1. Update - the number of times within a given period the data set is updated

   2. Reference - the number of times within a given period the data set is accessed for output.

e. Backup capability - used to indicate that the data set will or will not need a data set recovery method.

f. How is data currently stored - used to indicate the various methods or devices that are used to house the data.

g. Security:

1. Read - indicates that the data set will be protected from indiscriminate reading by unauthorized personnel.

2. Write - indicates that only authorized personnel will be allowed to update the data set.

h. Structure:

1. Formatted - indicates that the data set has a pre-defined storage layout.

2. Unformatted - indicates that the data set contains free form data.

i. Comments - used for amplifying remarks.

	File Size (logical records)	Logical Record Type	Logical Record Length (bytes)	Currency	Volume/Frequency Update	Volume/Frequency Reference (1)	Backup Capability	How is data currently stored	Security Read	Security Write	Structure Formatted	Structure Unformatted	Comments
1. Vegetation	170000 6800 2300	tree plot forest	90 120 50	5 yrs	2xs/week during field season	278/mo./ state	X	mag tape		X	X		
	625000	plant plot type	170 190 200	1 yr							X		one sample/640 acres
2. Soils	625000	properties msremts use class	160 360 120 20	10 yrs.	annual per site	260/mo./ state	X	odds and ends in JDR, range, wtrshd systems		X	X		one sample/640 acres
3. Minerals	797000	core/drill seam/field field/basin	150 190 80	10 yrs.	* annual per site	101/mo./ state	X	n/a		X	X		* data updated as any intensive investigations done and as utilization information tied in
4. Geologic	796875	strata engineering	250 170	one-time effort	* annual per site	278/mo./ state	X	n/a		X	X		3 holes/640 acres excluding Alaska * as more detail and/or accuracy obtained
5. Water	7400	well aquifer basin	60 80 60	1 yr.	2xs/week during field season	101/mo./ state	X	n/a		X	X		1 sample/twp
	7400	sample body wtrshed	390 150 80			278/mo./ state							
6. Wildlife	9130 913	herd popultn	2000 2000	1 yr.	*	278/mo./ state	X	n/a		X	X		913 plan. units * data updated anytime field work done which records any wildlife data
7. Meteorology	7400	station region climate	70 76 70	24 hrs. monthly	once daily	60/mo./ state	X	mag tape in N.F.D.R. system		X	X		excluding Alaska
8. Recreation	5000	complex (area/site)	300	1 yr.	weekly during high use season	2/day/ site	X	n/a		X	X		
9. Cultural	400000	site/area	160	one-time effort	*	350/mo./	X	n/a	X	X	X		excluding O.C.S. * data updated anytime applicable field data gathered
10. Land Records	70M.	2½ acre parcel	600	8 hrs.	done from case files and surveys	1700/mo./ state	X	mag tape		X	X	X (2)	excluding Alaska
		survey			400/year								
11. Case File	140000 **	cases stipulation	300 5000	5 min	60xs/day state	1200/mo./ state	X	mag tape for oil shale only		X	X	X (2)	excluding Alaska ** don't know inactive case file count
12. Socio-Economic	505	profile	1200	5 yr.	quarterly	1700/mo./ state	X	mag tape		X	X		one/county
13. Accounting	10M	accnt	2000	3 days	once daily	1800/mo./ state (3)	X	mag tape	X	X	X		WSCs x subact x pw
14. Protection	15000	fire	600	8 hrs.	daily during season		X	mag tape		X	X		3000/yr with 5 year history
15. Personnel and Organization	7000 150 750	person position course *	600 200 200	1 week	once daily	15/day/ site	X	mag tape	X	X	X		* 5 per position
16. Payroll	7000	person	1400	1 week	weekly	12/week/ site and once/2 wks	X	mag tape	X	X	X		
17. Property	74000	item/facility	400	1 week	once daily	1/day/site	X	mag tape		X	X		3073 - bldgs - other facilities - personal property
18. Mailing List	40000	mail label	80	2xs/yr.	monthly*	2xs/week	X	n/a		X	X		* fed from new utilization information
19. Text/Keyword	500000	abstract	2500	1 yr	once weekly	1700/mo./ state	X	paper		X		X	
20. U. R. A.	1826 (913x2)	narrative overlay coordin and ptrs	4600 30000	1 yr. 1 yr.	*	278/mo./ state	X	paper		X	X	X	updated anytime field work can refine data/ (4)
21. M. F. P.	1826 (913x2)	narrative overlay	9200 30000	1 yr.	3xs/year	1700/mo./ state	X	paper		X	X	X	(4)
22. Program Plans	15000 400	AMP/ HMP/ Program Plan Program Plan	4600 9200	1 yr.	annually weekly during budget process	* *	X	paper		X	X	X	 * continuously by budget 4-5 times a year per state
23. Budget Allotment	80	budget	9200	1 yr.	annually	4000/yr. @ w.o.	X	paper		X	X	X	
AWP/Op Budget Progress Report			Updating function for Accounting										
EAR/EIS			Stored in files 1-9 and 19										

NOTES: (1) Per state figures do not mean that the references are done at the state office.
(2) Special stipulations and survey notes
(3) Excludes dollar outlay references.
(4) Most of file will include pointers to base files.

Table 5-1. Data Set Attributes

5.2.3 Application Environment

5.2.3.1 ADP Systems

Figures 6 and 7 depict an overview of the hardware and software configurations. Figures 8 through 14 detail the environment provided for the application programs considered for implementation for BLM.

As discussed in detail in the previous sections, it should be noted that there are two systems, concurrent and yet distinct, that form the total set of services required to control and manage the system resources (the control system) and control and manage the data base/data communications requirements of the BLM system. Within the environment provided by the two software packages, and fully utilizing the services and resources made available through them, the application programs, defined to satisfy the ADP requirements of BLM, are executed. In each of the Figures (8 through 14), these application programs or packages are at the center of the activity sandwiched between the data base/data communication facilities, the control system, and finally the hardware.

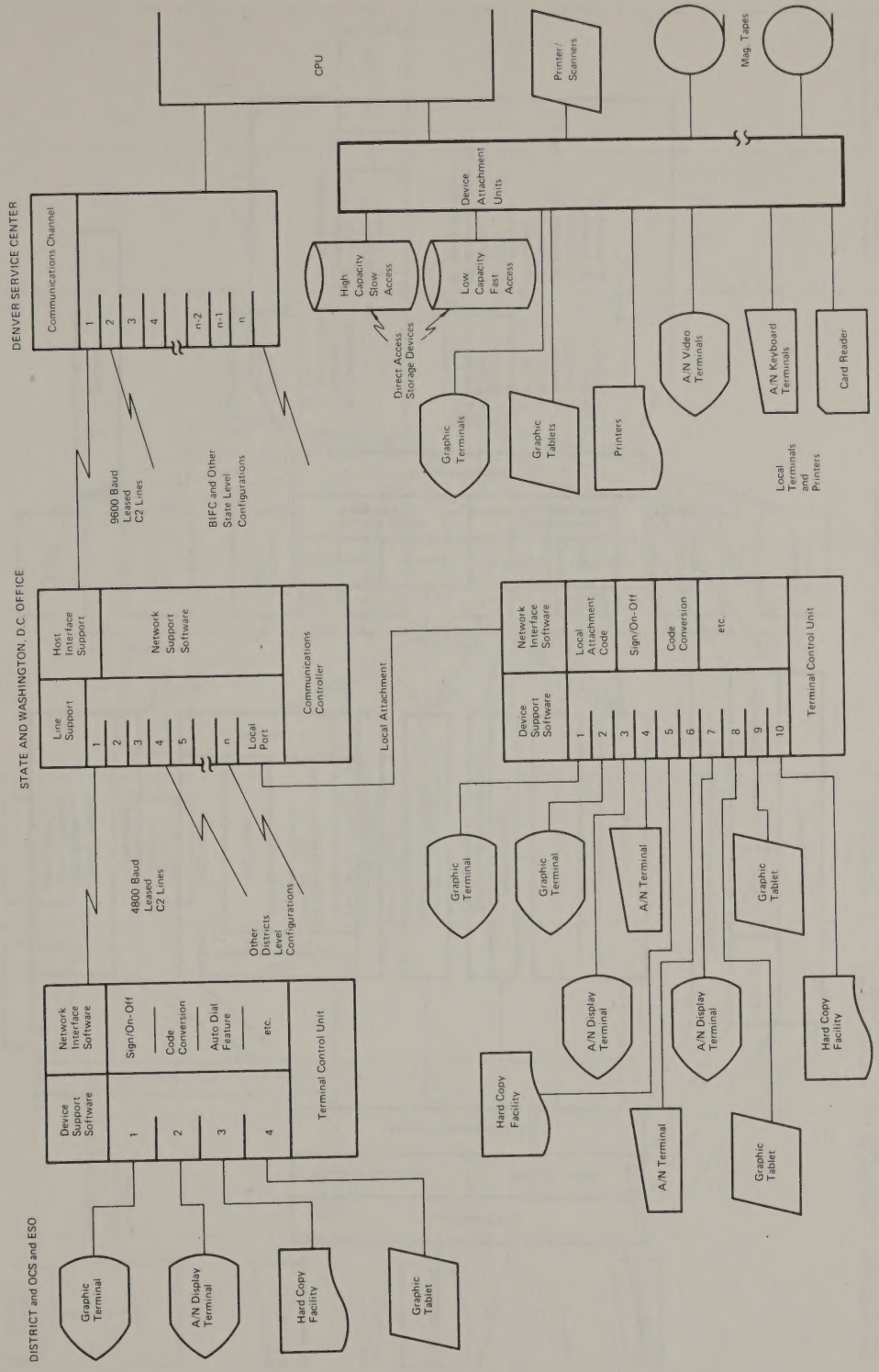


Figure 6. Hardware System Overview

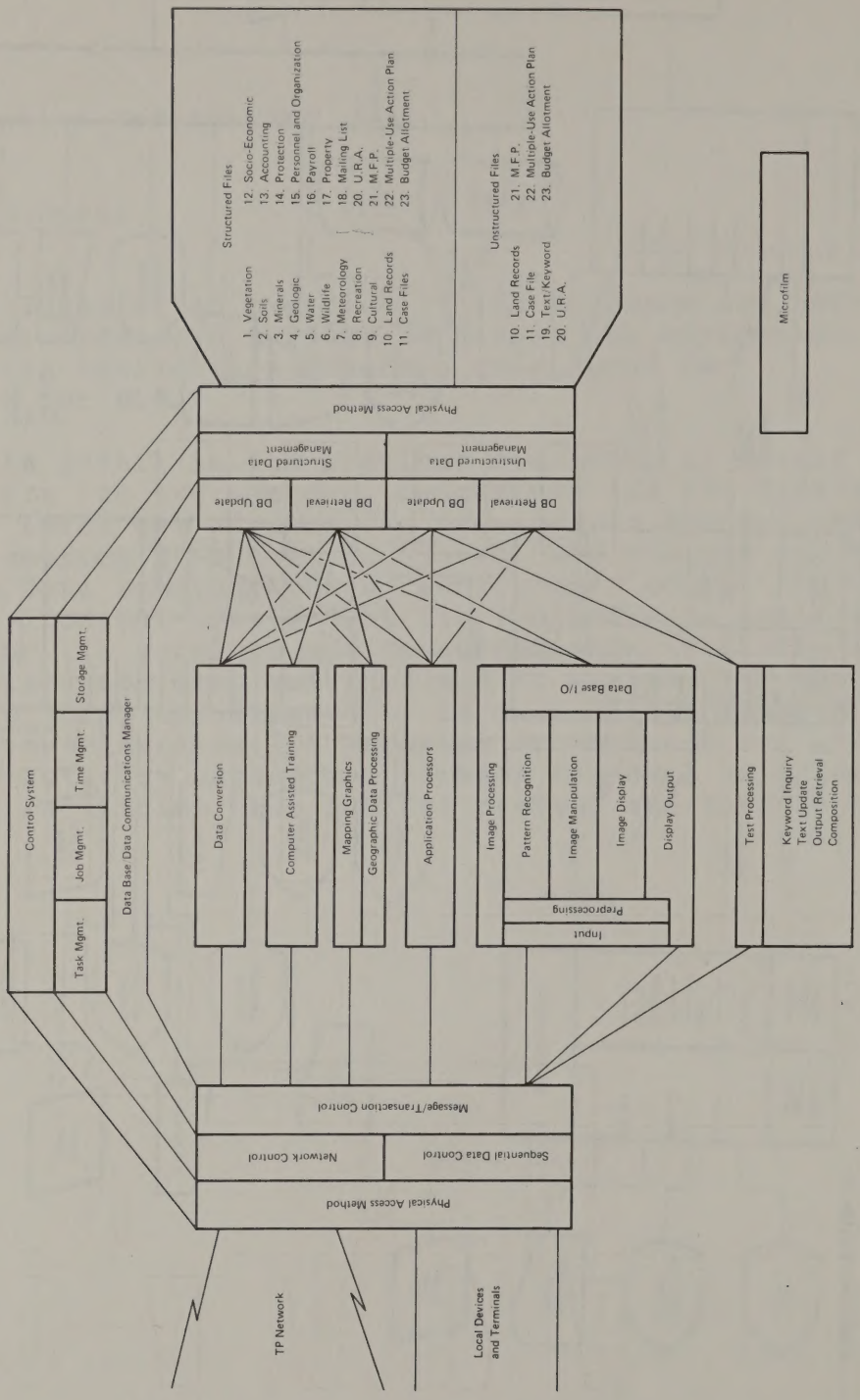


Figure 7. System Software Overview

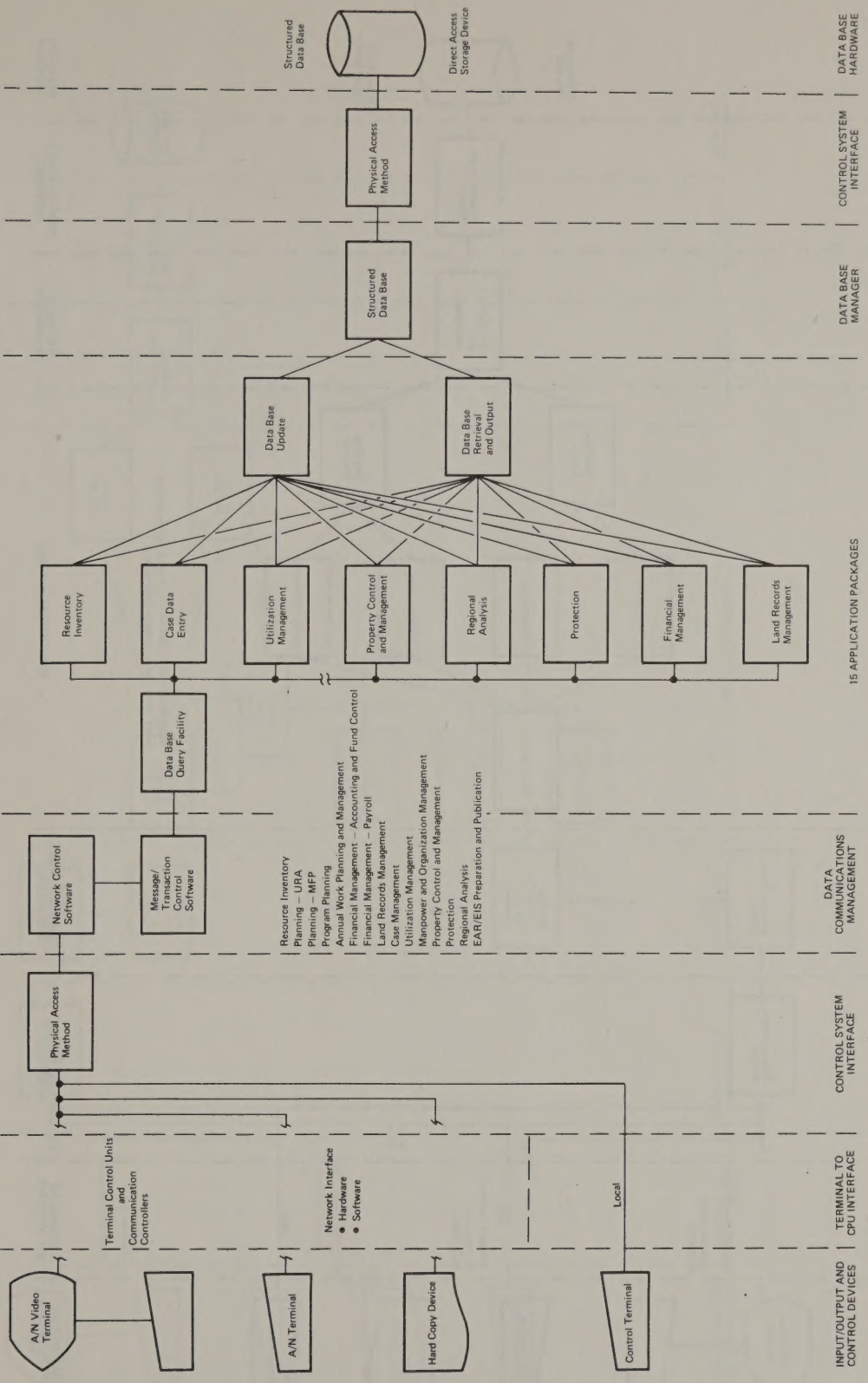


Figure 8. Structured Data Handling

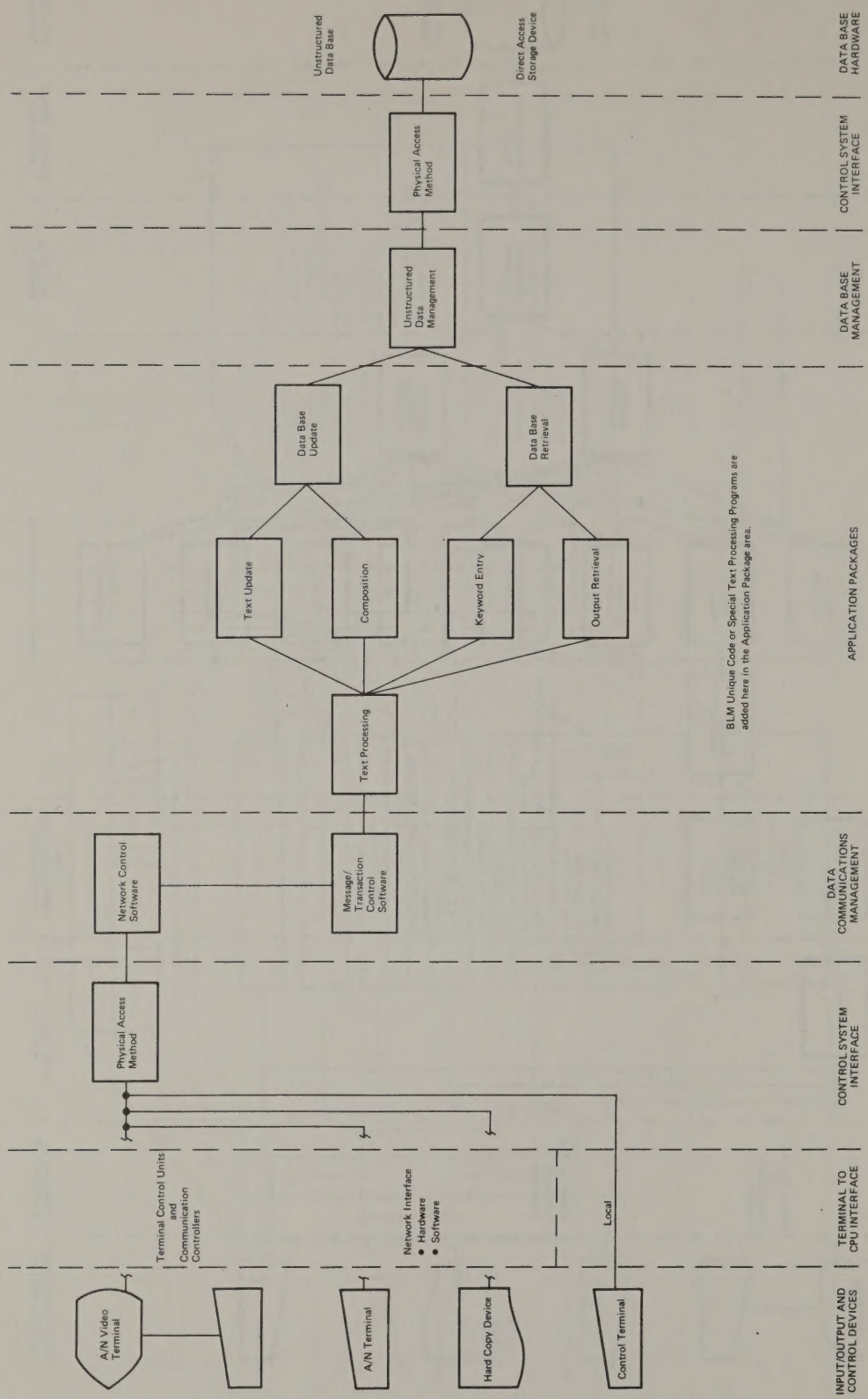


Figure 9. Text Processing System Flow

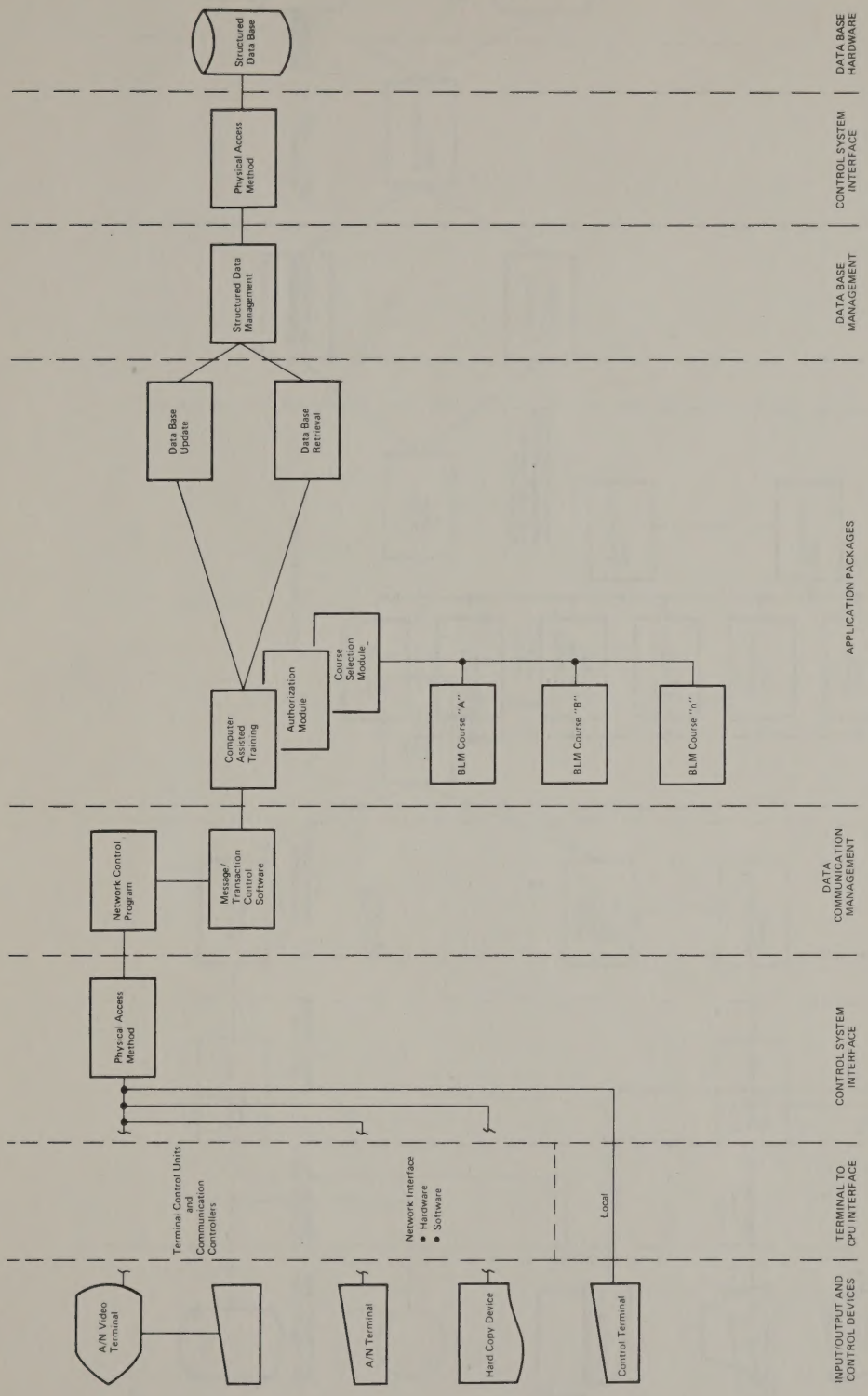


Figure 10. Computer Assisted Training System Flow

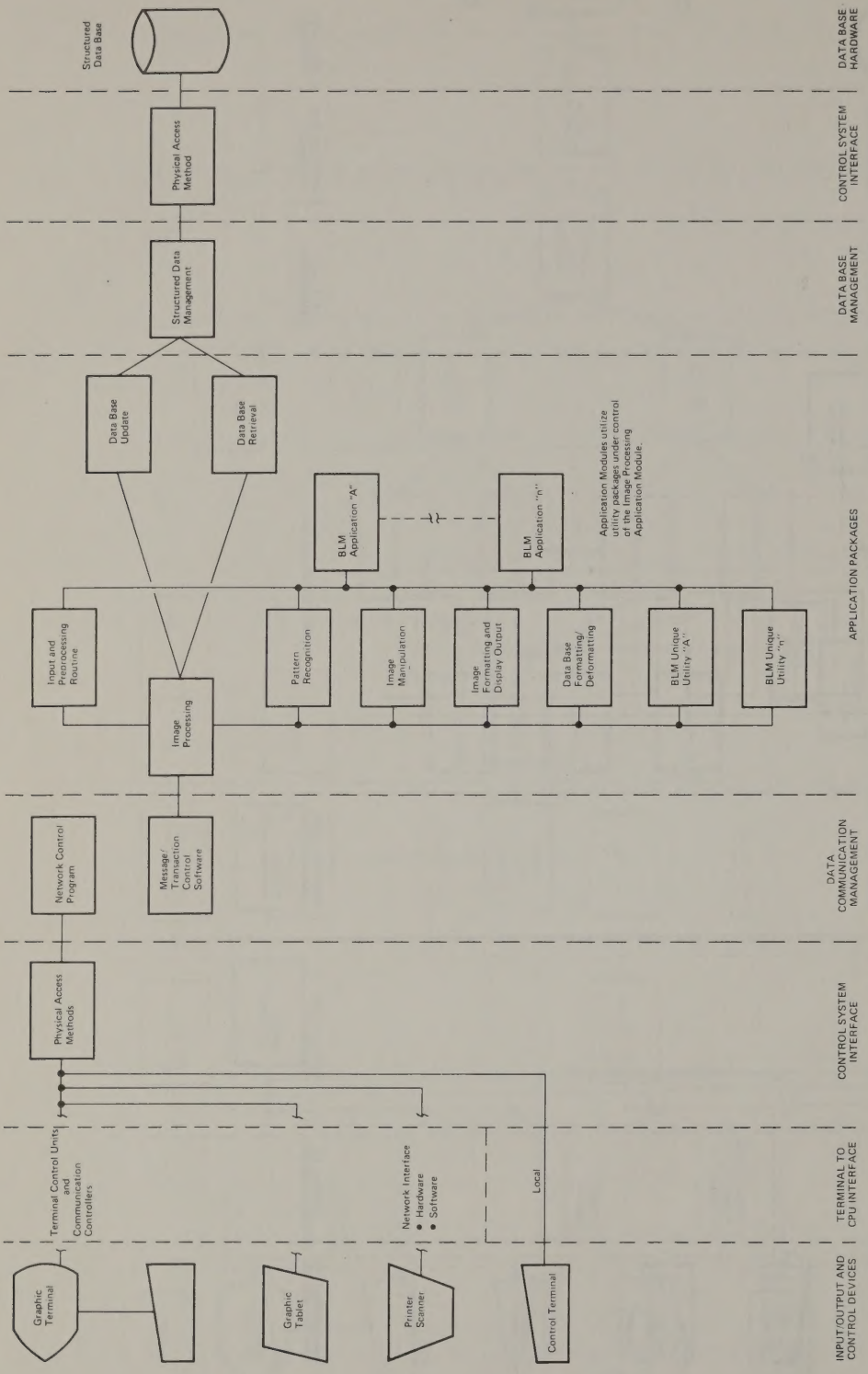


Figure 11. Image Processing System Flow

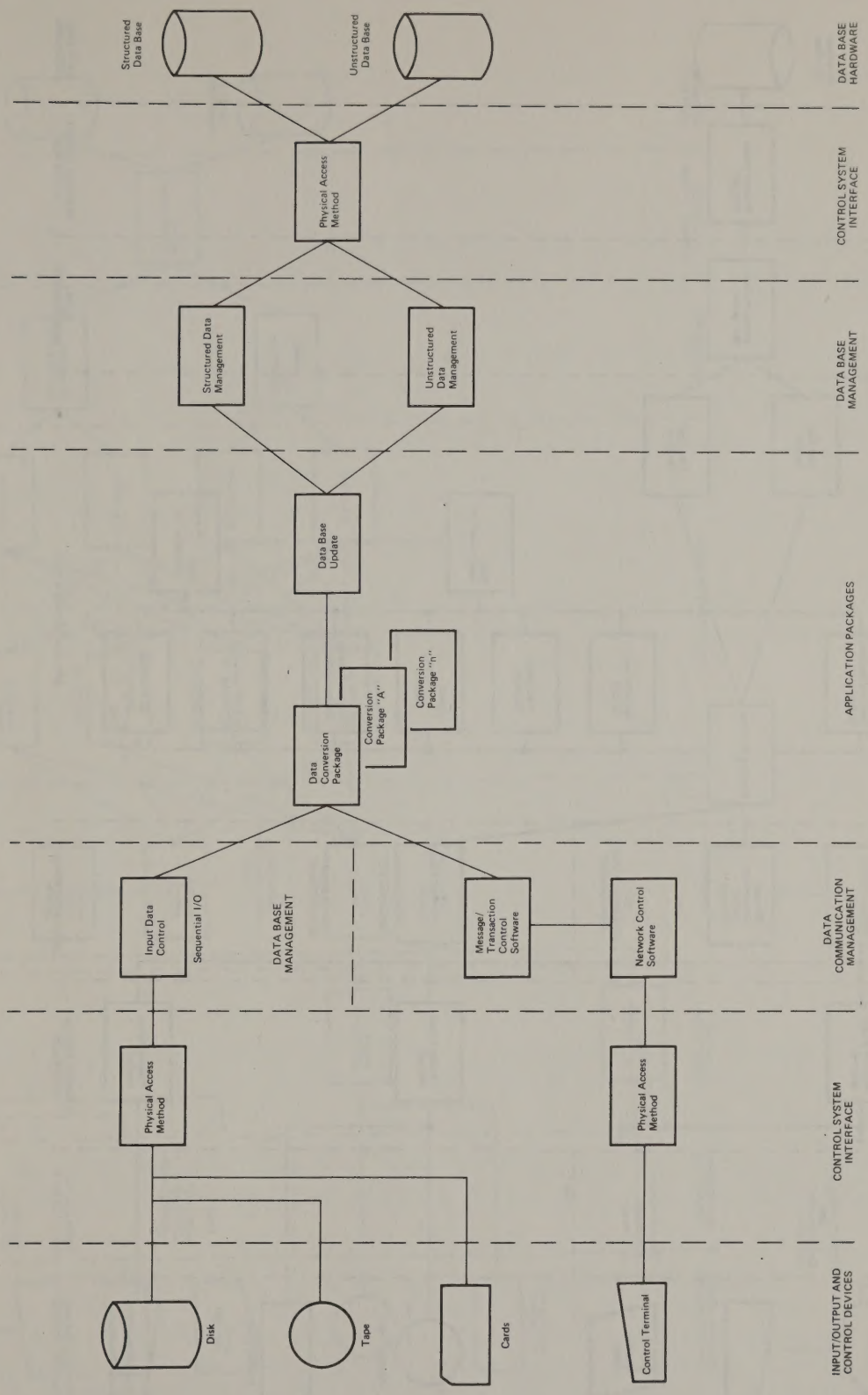


Figure 12. Data Conversion System Flow

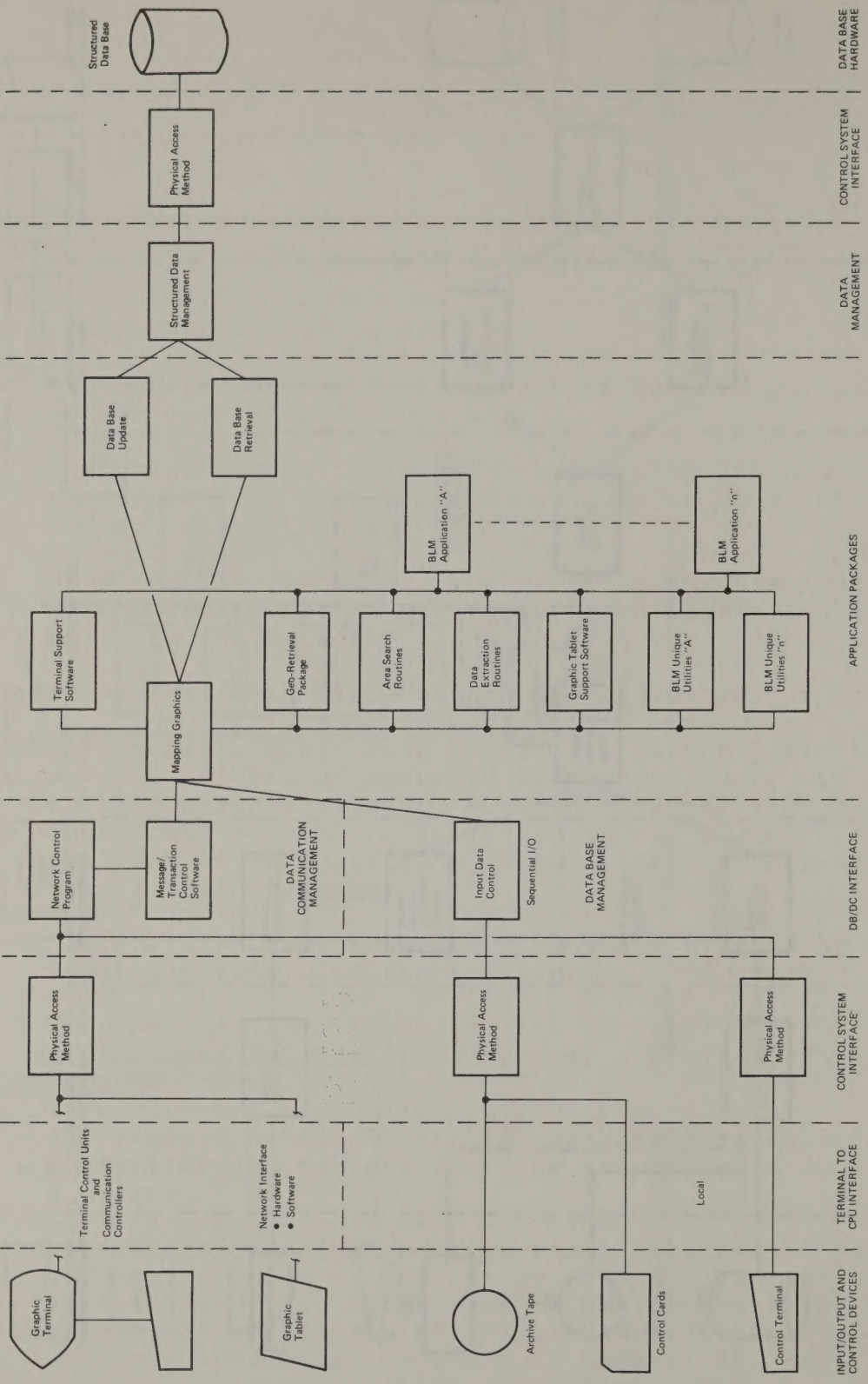


Figure 13. Mapping-Graphics System Flow

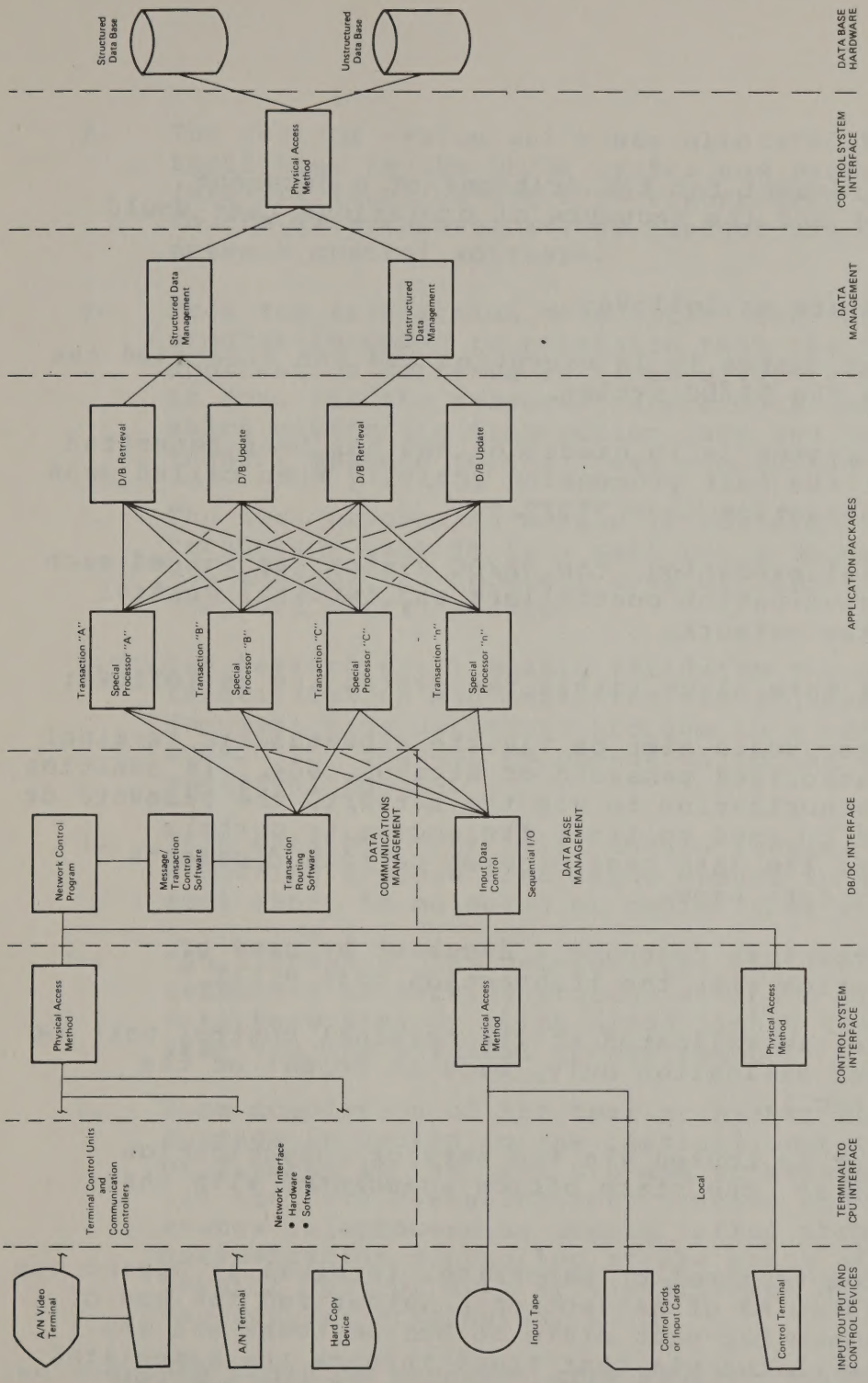


Figure 14. Special Processing System Flow

Consider a typical request for the printout of a document (reference Figure 9) and the sequence of operations that would take place.

The assumptions are as follows:

a. The control system is in execution and has allocated the network to the DB/DC system.

b. The DB/DC system is in execution and has been generated to support the text processing activity when called upon by the transaction code "TEXT."

c. Upon initial execution, the DB/DC system has loaded each of the communication controllers and terminal control units in the network.

The activities that take place within the system are as follows:

a. The operator would sign on via the alphanumeric terminal with an authorized password or sign-on code. In addition to this authorization to use the network, the password or code could be used to limit the access to certain portions of the data base or even certain documents within the data base.

b. The operator then requests a document by name or identification with the transaction code "TEXT."

c. The request is validated at the terminal control unit (a first level validation only, such as format of the request, etc.).

d. The request is routed via the network communication controller at the state office associated with that district.

e. The control terminal or supervisor terminal at Denver has already (step #3 of assumptions) authorized the use of certain lines for each state to Denver trunk and the request is routed via that trunk through the associated physical access method which is part of the control system.

f. The control system which has allocated the network facilities to the DB/DC system now passes the request (via its input/output supervisor) from the access method to the data communications manager and its associated network control software.

g. From the transaction code "TEXT" the network control program is coded to recognize that the text processing application software is to be given this request....this is done via the message/transactions control software which strips the transaction code and passes the document request message to the "text processing" module.

h. The text processing module interprets the request, recognizes that it is a call for a document and routes the message and document name or identification to the "Keyword entry" module.

i. The keyword entry module validates the document identification and initiates the request to move the document from permanent storage to a temporary or working area. The request is passed on to the data base retrieval module.

j. This data base retrieval module locates the document and a working storage area large enough to accommodate the text about to be moved or copied from permanent storage.

k. The address of the document and the location of the temporary or working storage area are passed on to the data base manager which accomplishes the transfer of the text via the physical access method.

l. Upon completion of the text transfer, an acknowledgment message is routed to the terminal operator. The message originates in the text processing module and trasmitted via the data communications manager and the control system teleprocessing access method through the communication controller at the state office and to the terminl control unit at the district office from whence the request originated.

The sequence would be repeated with similar transaction codes and messages to modify the text in working storage, to add formatting instructions to the document, and to request an output (hard copy)

of that document. The capabilities and limitations of the text processing system depend on the kind of package installed at Denver. Three options are available: (1) the Bureau can code an extensive text processing application that fits their particular needs, or (2) the Bureau can purchase or lease an existing package and modify it if it does not meet BLM's requirements, or (3) the Bureau can purchase the kind of system that would require no modification.

Each of the ensuing figures (8 and 10 through 14) addresses a different BLM application package. Similar sequences of procedures to those described above would exist in each case. Unlike text processing, however, most of the described applications are peculiar to BLM and are not as readily available on the market....hence, more likely the need to develop that capability internally.

5.2.3.2 ADP Capabilities

5.2.3.2.1 Introduction

The degree of potential power an ADP capability must contain is dependent on what user tasks it must satisfy and how the user is ultimately going to use the capability. So, the first step is to determine, generally, what the user will need in the way of ADP capabilities based on his overall information requirements. This is the list contained in Appendix A. Next, specific user tasks must be correlated with the ADP capabilities needed to support it. This was done for each application area. All tasks from all application areas were then associated with the particular ADP capability required.

The ADP capabilities are listed on the subsequent pages followed by all the application package tasks they will support.

When developing a particular ADP capability, all of the tasks and application packages affected must be considered. This provides the necessary requirement information to design the maximum amount of generality into each capability that is feasible. In this way, the general ADP capability can be used by multiple designated tasks when implemented. For example, if the update capability of

the Structured Data Handling process was developed initially for use by the Resource Inventory Application Package, whenever the Case Management Application Package is implemented (e.g., OCS O&G lease data introduced into the system), the capability would be available for its use.

The design of each ADP capability is dictated by the various tasks it is intended to support. Careful examination of these tasks reveals the level of support that must be provided by the ADP capability. For example, if the Structured Data Handling Update Capability is to do extensive resource data editing, the similar edits needed by the Case Management application or any other application area should be included in the design of that capability.

By examining what tasks must be supported in each application area by an ADP capability, the intricate parts of the ADP capability can be established. For example, examination of the tasks listed under the Structured Data Handling Update capability indicate that it should include the features outlined in Figure 15. The tasks to be supported by other system ADP capabilities were analyzed in this same manner in order to derive the high level design structures presented in Figure 16 through 20.

Figure 5-15. High Level Design: Structured Data Handling

Figure 5-16. High Level Design: Text Processing System

Figure 5-17. High Level Design: Computer Assisted Training System

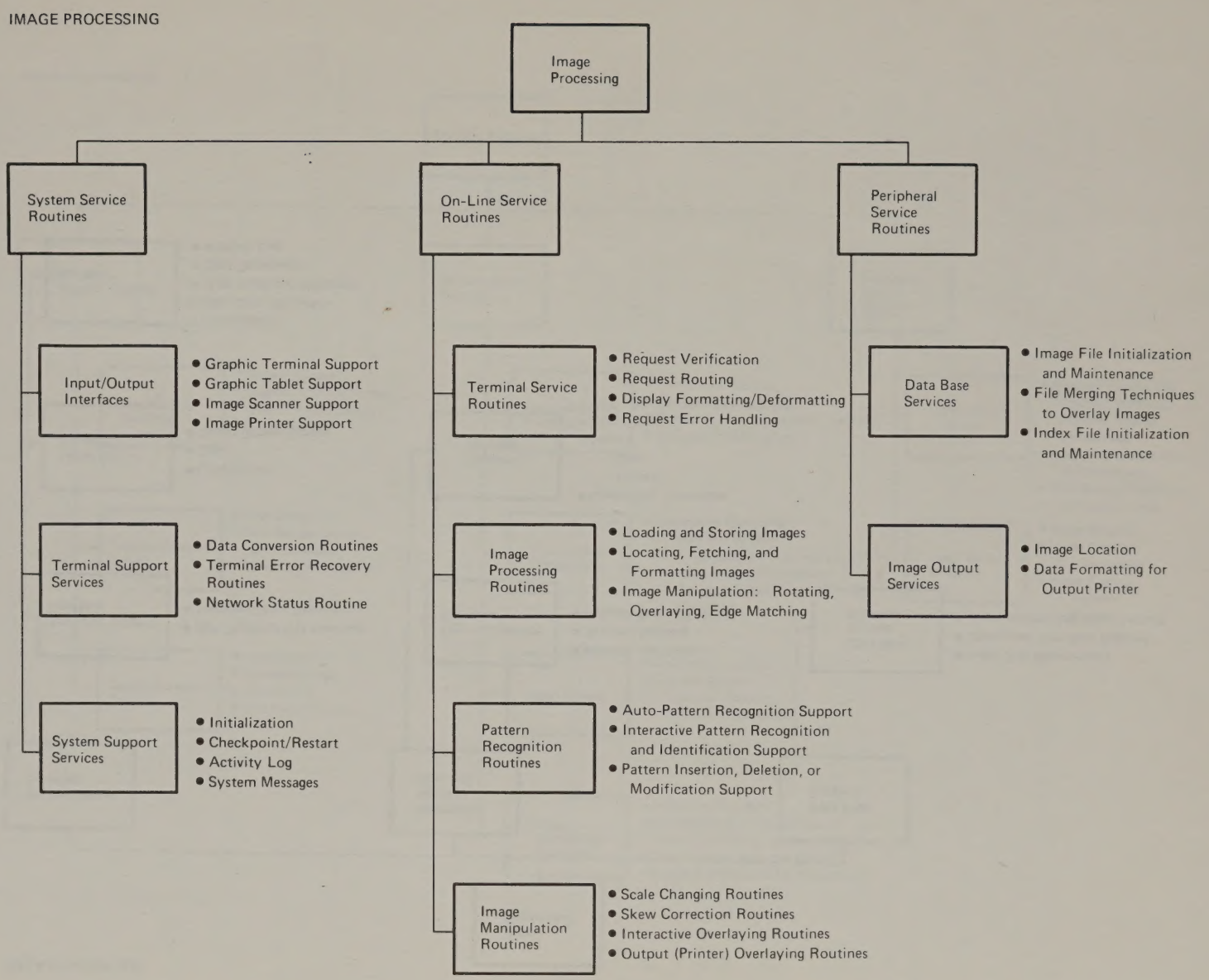


Figure 5-18. High Level Design: Image Processing System

Figure 5-19. High Level Design: Data Conversion System

Figure 5-20. High Level Design: Mapping-Graphics System

By developing an ADP capability in this way, the initial effort may be increased, but the subsequent benefits are significant in avoiding repeated development efforts. When other packages or tasks are implemented the generalized ADP capabilities needed will already exist, requiring only the appropriate development of application specific programs and the necessary procedures modification and training. The savings in development time and the attendant rapidity of implementation are the anticipated benefits of this approach.

This approach, also, gives BLM a great deal of flexibility in its implementation options. Careful consideration should be given to which package and which tasks in that package are selected for implementation. Judicious planning at this stage of development can result in considerable savings. For example, if a task requires a seldom used ADP capability, the development of that ADP capability may not be as important as a more commonly used ADP capability. Of course, the task will also have to be examined closely to determine its operational urgency of implementation.

5.2.3.2.2 Tasks Using ADP Capabilities

For each ADP capability, the tasks are listed under their respective application package headings by the number or letter used in the description of that package in Section 6. This will enable the reader to cross reference to the package for additional review material.

o STRUCTURED DATA HANDLING - UPDATE

6.1 Resource Inventory

c. Interpretation and Analysis

1. Edits the attribute data.

2. Store/update field collected:

(a) attribute data.

6.2 Planning - Unit Resource Analysis (URA)

e. Analyze and record current resource situation

4. Update URA statistical data to reflect current resource conditions.

5. Compare current URA narratives to current resource inventory data.

6.4 Program Planning

c. Determination and quantification output objectives and input actions for each of the 7 resource programs:

2. Quantification of output objectives and input actions.

d. Coordination and recordation of quantified data into a single integrated Resource Area MAP:

3. Recordation of MAP data sheets.

e. Review and quantification of Resource Area MAPs for district level inputs and objectives:

5. Quantification of district input actions and output objectives.

f. Coordination and recordation of MAP data into a single MAP requires the same ADP capabilities as District, State and Bureau wide MAPs as required for Resource Area MAPs (d).

g. Review and quantification of MAP data for State level inputs and Bureau level inputs requires the same ADP capabilities as required for District level input quantification (e).

h. Assessment and recordation of program priorities

2. Recordation.

6.5 Annual Work Planning and Program Management

a. AWP ADVISES:

2. Recordation.

b. Preliminary AWP based on planning allowance:

2. Recordation.

c. AWP based on approved funds.

2. Recordation.

d. AWP:

2. Recordation.

e. AWP:

1. Approval

2. Establishment of operating budget.

f. Operating budget:

1. Maintenance.

6.6 Financial Management - Accounting and Fund Control

a. Meet the requirements of various concerned Bureaus, Departments and Congress:

1. Accounting.

b. Provide coordinated control of funds for all program activities:

1. Record expenditures.

d. Recordation of financial data in a consistent and uniform manner.

e. Facilitate determination of the fidelity of persons administering public funds and properties.

6.7 Financial Management: Payroll

a. T&A

1. Record and sign T&A

2. Supervisor or timekeeper sign

3. T&A reports sent to DSC.

6.8 Land Records Management

a. Posting of use plats

2. Type in notation.

b. Post Historical Index and other indexes

2. Type in notation.

6.9 Case Management

o Caseflow

a. Initiation

1. Bureau motion/filing

2. Date/time stamped

3. Serialized and registered

4. Assemble application

5. Post land status record

6. Collect filing fee and notify accounting.

b. Preadjudication

5. Correct/update/note application information descrepancies.

c. Management Options Selection

6. Record information on land status record.

d. Adjudication

2. Determine stipulations

4. Accept bids

7. Establish performance bond

8. Post track book

9. Post plats.

6.10 Utilization Management

- Compliance checking

  b. Inspect the site:

     2. Modify the contract

     3. Extend the contract

     4. Terminate the contract

     5. Make recommendations.

  b. Update the case file.

- Trespass identification and processing

  c. Update the trespass records.

  e. Initiate cancellation action.

  f. Administer settlement.

- Notification of bills due

  d. Note case file when monies received.

  f. Initiate cancellation.

6.11 Manpower and Organization Management

- Personnel management

  b. Manpower utilization

4. Select qualified personnel.

c. Personnel management evaluation

1. Establish cyclical audit

2. Conduct interviews

3. Assess effectiveness

4. Evaluate.

d. Employee performance evaluation

1. Conduct appraisal session

2. Evaluate employee.

e. Personnel records management

1. Establish employee skills

2. Record employee training.

o Organization management

a. Planning

3. Recommend changes

b. Structure alteration

2. Initiate change proceeding.

6.12 Property Control and Management

o Stores and equipment

a. Inventory and control

1. Record property information.

b. Utilization and Maintenance

1. Report utilization and maintenance.

o Real Property

d. Utlization

4. Report Utilization.

e. Maintenance

1. Develop schedule.

6.13 Protection

a. Preliminary analysis

1. Determine costs:

(a) Load model data.

2. Evaluate effectiveness:

(a) Load model data.

b. Prevention

1. Protection resources inventory:

(b) Summaries.

d. Suppression

1. Assess damage/effectiveness

(e) Enter utilization information:

(1) Personnel

(2) Property.

6.14 Regional Analysis

a. Gathering of SED data

3. Collect additional data

5. Review and compile into BLM usable form.

o STRUCTURED DATA HANDLING - PREDEFINED RETRIEVAL/OUTPUT

6.1 Resource Inventory

a. Field preparation

2. Assemble the selected area's:

(c) Previous survey results

5. Establish a work plan including:

(b) Equipment needed list.

c. Interpretation and analysis

5. Develop progress report.

6.2 Planning - Unit Resource Analysis (URA)

a. Title page preparation.

d. Profile preparation:

1. Analyze current resource status for necessary modifications.

4. Analyze current resource status.

e. Analyze and recordation of current resource situation:

1. Compare current URA overlays against current resource inventory data.

3. Compare current URA statistical data against current resource inventory data.

5. Compare current URA narratives to current resource inventory data.

f. Analysis and recordation of resource capability and opportunity for development:

1. Obtain information from trend studies.

2. Prepare supporting tabulations which show future condition statisitcs keyed to the overlays.

g. Preparation and recordation of Ecological Profile:

1. Determine biomes and major communities from physical profile data.

5. Prepare narratives describing planning unit biomes and communities.

4. Extract data from physical profile and URA step 3 that act as ecological change agents.

10. Prepare supporting tabulations showing acreage statistics for each class area by trend.

11. Extract data from URAs step IV which are potential class change agents.

13. Prepare tabulations showing future acreage statistics for each predicted class area.

6.3 Planning - Management Framework Plan

a. Analysis and recommendation of optimum use for each of seven resources:

2. Retrieve data on URA capability and potential, social and economic needs, interagency commitments.

c. Determination and recordation of needed support activities:

1. Consider adequacy of present support.

e. Decision on which activity plans to adopt and to what extent:

1. Reference to district management profile to determine who to contact and when.

6.4 Program Planning

c. Determination and quantification of output objectives and input actions for each of the 7 resource programs:

1. Determination of output objectives and input actions.

e. Review and quantification of Resource Area MAPs for district level inputs and objectives:

1. Review of MAP data sheets.

4. Determination of district output objectives and input actions.

g. Review and quantification of MAP data for State level inputs and Bureau level inputs requires the same ADP capabilities as required for District level input quantification.

6.5 Annual Work Planning and Program Management

a. AWP advice:

3. Distribution.

b. Preliminary AWP based on planning allowance:

3. Distribution.

c. AWP based on approved funds:

3. Distribution.

d. AWP:

f. Operating budget:

2. Program monitoring.

6.6 Financial Management - Accounting Fund and Control

a. Meet the requirements of various concerned bureaus, departments and Contress:

2. Reporting.

c. Provide standard and uniform financial statements and reports.

6.7 Financial Management and Payroll

a. T&A

5. Produce reports.

b. T&A Analysis

2. Produce reports.

6.8 Land Records Management

a. Posting of Use Plats.

1. Select MT or Use Plats:

(a) Notation and vector attribute.

b. Posting Historical Index and Other indexes.

1. Select desired index notation only.

3. Display new index.

6.9 Case Management

o Caseflow.

a. Initiation

8. Prepare status report.

b. Preadjudication

1. Examine application

3. Examine land status record

4. Examine other application for conflict.

c. Management Options Selection

1. Review resource, UFA, MFP:

(a) Attribute data.

d. Adjudication

1. Ensure recurring payment made

5. Compile list of bids

10. Prepare and issue lease, license, etc.

o Appraisal

b. Check comparable sales and rental data

d. Prepare appraisal report.

6.10 Utilization Management

o Compliance checking

c. Prepare final inspection report.

o Trepass Identification and Processing

a. Investigate for violation

b. Prepare trespass report

d. Issue notice of trespass

g. Prepare final disposition report.

o Notification of bills due

a. Identify contractural monetary obligations

b. Determine date monies due

c. Notify applicant when due

e. Notify applicant of over due bill.

6.11 Manpower and Organization Management

- Personnel Management
  - a. Manpower planning
    - 1. Determine BLM programs
    - 2. Determine BLM workload:
      - (a) Current
    - 3. Determine attrition rate.
  - b. Manpower Utilization
    - 1. Determine recruitment needs
    - 2. Examine work force composition.
  - c. Personnel Management Evaluation.
    - 5. Report evaluations
- Organization Management
  - a. Planning
    - 1. Determine organizational structure.

6.12 Property Control and Management

- Stores and Equipment
  - a. Inventory and Control:
    - 3. Generate reports.
- Real Property
  - c. Accountability:
    - 3. Generate reports.

6.13 Protection

a. Preliminary Analysis

1. Determine costs:

(c) Extract resources/cost

2. Evaluate effectiveness:

(c) Extract model data.

c. Presuppression

1. Determine commitment:

(a) Retrieve:

(4) Summaries.

d. Suppression

1. Assess damage/effectiveness:

(f) Summarize utilization.

6.14 Regional Analysis

a. Gathering of SED data

1. Identify source of information.

c. Prepare and maintain supporting documents

2. Narrative descriptions.

6.15 Environmental Analysis Report/Environmental Impact Statement (EAR/EIS) Preparation and Publication

a. Identify information source

Select team.

b. Identify potential impacts.

e. Identify agencies to contact.

f. Identify design mitigations

Short/Long term impacts.

16.4 STRUCTURED DATA HANDLING - AD HOC RETRIEVAL/OUTPUT

6.2 Planning - Unit Resource Analysis (URA)

d. Profile preparation:

1. Analyze current resource status for necessary modifications.

4. Analyze current resource status overlay.

e. Analyze and record current resource situation:

1. Compare current URA overlays against current resource inventory data.

3. Compare current URA statistical data against current resource inventory data.

f. Analysis and recordation of resource capability and opportunity for development:

1. Obtain information from trend studies

2. Analyze information in terms of predicting full potential for each resource.

5. Prepare supporting tabulations which show future condition statistics keyed to the overlays.

g. Preparation and recordation of ecological profile:

4. Extract data from physical profile and URA step 3 that act as ecological change agents.

6. Analyze ecological relationships to determine classifiction ratings.

12. Analyze information to determine where class ratings can be ignored.

6.3 Planning - Management Framework Plan (MFP)

c. Determination and recordation of needed support activities.

2. Consider adequacy of present support.

6.4 Program Planning

a. Preparation and recordation of resource area MAP narrative:

1. Preparation.

b. Preparation of graphic displays showing program recommendation areas:

1. Preparation.

c. Determination and quantification of output objectives and input actions for each of the area resource programs:

1. Determination of output objectives and input actions.

e. Review and quantification of Resource Area MAPs for district level inputs and objectives:

4. Determination of district output objectives and input actions.

g. Review and quantification of MAP data for State level inputs and Bureau level inputs requires the same ADP capabilities as required for District level input quantification.

6.6 Financial Management - Accounting and Fund Control

a. Meet the requirements of various concerned bureaus, departments and Congress:

2. Reporting.

6.12 Property

o Stores and Equipment

a. Inventory control

2. Reference property information

b. Utilization and maintenance

2. Determine utilization and maintenance

o Real Property

c. Accountability

2. Reference property information

d. Utilization

2. Determine utilzation

6.13 Protection

b. Prevention

1. Protection resources inventories:

(a) Retrieve:

(1) Personnel records

(2) Stores/equipment records

(3) Real property records

2. Hazard assessment/control:

(b) Retrieve resources data

a. Presuppression

1. Determine commitment

(a) Retrieve:

(1) Personnel records

(2) Restores/equipment records

(3) Real property records

d. Suppression

1. Assess damage/effectiveness

(c) Retrieve land resources

e. Rehabilitation

1. Determine rehabilitation needs:

(a) Retrieve stores/equipment

o MAPPING/GRAPHICS - DATA ENTRY/MODIFICATION

6.1 Resouurce Inventory

a. Field preparation

3. Prepare type map of area to be inventoried

c. Interpretation and Analysis

2. Store/update field collected:

(b) Type map data

6.2 Planning - Unit Resource Analysis (URA)

d. Profile preparation:

5. Update overlays as necessary.

e. Analyze and record current resource situation:

2. Update URA overlays to reflect current resource conditions.

f. Analysis and recordation of resource capability and opportunity for development:

3. Prepare overlays depicting resource opportunity and capability at full potential.

g. Preparation and recordation of Ecological Profile:

2. Add biome and community delineations to vegetative profile overlay.

5. Prepare overlay worksheet using extracted data.

7. Update ecological overlay worksheet with delineations showing each classification rating.

8. Prepare ecological profile overlay using worksheet delineation.

6.3 Planning - Management Framework Plan (MFP)

a. Analysis and recommendation of optimum use for each of 7 resources:

3. Add optimum use recommendation areas to conversion unit base modification.

b. Identification, analysis, coordination and recordation of overlays and conflicts among resource activities:

3. Modify activity recommendation plans into multiple use plans based on recorded conflict and overlap.

5. Prepare multiple-use recommendation overlays.

c. Determination and recordation of needed support activities:

3. Prepare overlays to depict location of recommended support efforts.

d. Determination and recordation of contingency alternatives:

2. Prepare overlay depicting multiple-use recommendation if development occurs.

e. Decision on which activity plans to adopt and to what extent:

2. Modifications as necessary to multiple-use overlays where DM modifies.

f. Maintenance and periodic revision.

6.4 Program Planning

b. Preparation of graphic displays showing program recommendation areas:

1. Preparation.

c. Determination and quantification of output objectives and input actions for each of the 7 resource programs:

1. Determination of output objectives and input actions.

2. Quantification of output objectives and input actions.

d. Coordination and recordation of quantified data into a single integrated Resource Area MAP:

4. Recordation of MAP graphics.

f. Coordination and recordation of MAP data into a single MAP requires the same ADP capabilities for District, State and Bureau wide MAPs as required for Resource Area MAPs.

6.13 Protection

d. Suppression

1. Assess damage/effectiveness

(a) Outline damage area

6.14 Regional Analysis

a. Gathering of SED data

4. Identify areas on maps

o MAPPING/GRAPHICS - RETRIEVAL/OVERLAY

6.1 Resource Inventory

a. Field preparation

1. Select the site to be inventoried

2. Assemble the selected area's:

(a) Base maps

5. Establish a work plan including:

(a) Type map

b. Interpretation and Analysis

4. Develop type map

5. Develop progress report

6.2 Planning - Unit Resource Analysis (URA)

b. Location map preparation.

c. Base map preparation.

d. Profile preparation:

4. Analyze current overlay

6. Publish revised overlay narrative.

e. Analyze and record current resource situation:

1. Compare current URA OVERLAYS against current resource inventory data

6. Update URA narratives to reflect current resource conditions.

f. Analysis and recordation of resource capability and opportunity for development:

1. Obtain information from trend studies, plans from private and government groups and management practices

5. Prepare supporting tabulations which show future condition statistics keyed to the overlays.

g. Preparation and recordation of ecological profile:

1. Determine biomes and major communities from physical profile data.

3. Prepare narratives describing planning unit biomes and communities

6. Analyze ecological relationships to determine classification and trend rating

8. Prepare ecological profile overlay using worksheet delineation

9. Prepare supporting narrative describing each delineated quality class area

11. Extract data from text sources which are potential class change agents.

6.3 Planning - Management Framework Plan (MFP)

a. Analysis and recommendation of optimum use for each of 7 resources:

1. Retrieve data on URA capability and potential, social and economic needs, interagency commitments.

b. Identification, analysis, coordination and recordation of overlays and conflicts among resource activities:

1. Compare all activity recommendation areas for conflicts, overlays

4. Verify consistency of multiple use recommendations

5. Prepare multiple-use recommendation overlays.

c. Determination and recordation of needed support activities:

1. Analyze multiple use recommendations for support requirements.

e. Decision on which activity plans to adopt and to what extent:

1. Reference to District Manager profile to determine who to contact and when.

6.4 Program Planning

b. Preparation of graphic displays showing program recommendation areas:

2. Recordation.

c. Determination and quantification of output objectives and input actions for each of the seven resource programs:

1. Determination of output objectives and input actions

e. Review and quantification of Resource Area MAPs for district level inputs and objectives:

3. Review of MAP graphics

4. Determination of district output objectives and input actions.

g. Review and quantification of MAP data for State level inputs and Bureau level inputs requires the same ADP capabilities as required for District level input quantification.

6.8 Land Records Management

a. Posting of Use Plats

1. Select MT or Use Plat:

(b) Overlay

3. Display new MT or Use Plat

6.9 Case Management

o Caseflow

c. Management Options Selection

1. Review resource, URA, MFP:

(b) Type maps

6-13 Protection

b. Prevention

1. Protection resources inventories:

(c) Natural resource overlays

2. Hazard assessment/control:

(a) Retrieve resources overlay

(d) Develop hazard map

d. Suppression

1. Assess damage/effectiveness

(d) Display resources overlay

6.14 Regional Analysis

c. Prepare and maintain supporting documents

3. Include map of area

6.15 Environmental Analysis Report/Environmental Impact Statement (EAR/EIS) Preparation and Publication

c. Collect needed information

o Prepare area description

f. Evaluate potential impacts

- Reevaluate potential impacts
- Irrevocable resources

o TEXT PROCESSING - UPDATE

6.2 Planning - Unit Resource Analysis (URA)

d. Profile preparation:

3. Update profile narrative as necessary.

6.3 Planning - Management Framework Plan (MFP)

b. Identification, analysis, coordination and recordation of overlaps and conflicts among resource activities:

3. Modify activity recommendation plans into multiple-use plans based on recorded conflict and overlays.

f. Maintenance and periodic revision.

6.4 Program Action Planning

a. Preparation and recordation of resource area MAP narrative:

2. Recordation.

d. Coordination and recordation of quantified data into a single integrated Resource Area MAP:

2. Recordation of MAP narrative.

f. Coordination and recordation of MAP data into a single MAP requires the same ADP capabilities for District, State and Bureau wide MAPs as required for Resource Area MAPs.

h. Assessment and recordation of program priorities:

2. Recordation.

6.8 Land Records Management

c. Cadastral Survey Note Preparation

1. Type in text

2. Edit and correct

6.9 Case Management

o Caseflow

a. Initiation

4. Assemble:

(b) Supporting papers

6.15 Environmental Analysis Report/Environmental Impact Statement (EAR/EIS) Preparation and Publication

h. Document:

2. Preliminary draft modification

4. Draft is modified

6. Final EIS modified

o TEXT PROCESSING RETRIEVAL/OUTPUT

6.1 Resource Inventory

a. Field preparation

2. Assemble the selected areas

(b) Technical literature

4. Determine the selected area's:

6.2 Planning - Unit Resource Analysis (URA)

d. Profile preparation:

1. Analyze current narrative status for necessary modifications.

e. Analyze and record current resource situation:

3. Compare current URA narrative to current resource inventory data

f. Analysis and recordation of resource capability and opportunity for development:

1. Obtain information from trend studies, plans from private and government groups and management practices.

g. Preparation and recordation of ecological profile:

1. Determine biomes and major communities from physical profile data, text or other available sources

4. Extract data from physical profile and URA step 3 that act as ecological change agents

6. Analyze ecological relationships to determine classification and trend ratings

11. Extract data from URAs step IV which are potential class change agents.

6.3 Planning - Management Framework Plan (MFP)

a. Analysis and recommendation of optimum use for each of seven resources:

1. Retrieve data on URA capability and potential social and economic needs, interagency commitments.

b. Identification, analysis, coordinations and recordation of overlays and conflicts among resource activities:

4. Verify consistency of multiple use recommendations.

c. Determination and recordation of needed support activities:

1. Analyze multiple use recommendations for support requirements.

d. Determination and recordation of contingency alternatives

3. Prepare narrative supporting overlay.

e. Decision on which activity plans to adopt and to what extent:

1. Reference to District Management profile to determine who to contact and when.

6.4 Program Planning

a. Preparation and recordation of resources area MAP narrative:

1. Preparation.

c. Determination and quantification of output objectives and input actions for each of the seven resource programs:

1. Determination of output objectives and input actions.

e. Review and quantification of Resource Area MAPs for district level inputs and objectives:

5. Quantification of district input actions and output objectives.

g. Review and quantification of MAP data for State level inputs and Bureau level inputs requires the same ADP capabilities as required for Distrcit level input quantification.

6.5 Annual Work Planning and Program Management

a. AWP advises:

1. Determination.

(b) Survey method

(c) Number of plats

(d) Number of transects

6.9 Case Management

o Caseflow

b. Preadjudication

2. Examine supporting papers

c. Management Options Selection

5. Compile technical report

6.15 Environmental Analysis Report/Environmental Impact Statement (EAR/EIS) Preparation and Publication

c. Identify related studies

Collect needed information

d. Identify existing regulations

p. Evaluate potential impacts

Identify design/operation changes

Alternative approaches

Document

Preliminary draft production

o TEXT PROCESSING - Composition

6.2 Planning - Unit Resource Analysis (URA)

d. Profile preparation:

6. Publish revised profile narrative.

f. Analysis and recordation of resource capability and opportunity for development:

4. Prepare supporting narratives keyed to the overlays describing resource opportunity and capability at full potential.

g. Preparation and recordation of Ecological Profile:

3. Prepare narratives describing planning and biomes and communities.

9. Prepare supporting narrative describing each delineated quality class area.

14. Prepare narratives supporting each table describing each predicted class area.

6.3 Planning - Management Framework Plan (MFP)

a. Analysis and recommendation of optimum use for each of 7 resources:

4. Prepare narrative justification for each resource recommendation area.

c. Determination and recordation of needed support activities:

4. Prepare narratives justifying each support recommendation.

d. Determination and recordation of contingency alternatives:

3. Prepare narrative supporting overlay.

e. Decision on which activity plans to adopt and to what extent:

3. Narratives prepared as necessary justifying modifications.

6.4 Program Planning

a. Preparation and recordation of resource area MAP narrative:

2. Recordation.

d. Coordination and recordation of quantified data into a single integrated Resource Area MAP.

2. Recordation of MAP narrative.

f. Coordination and recordation of MAP data into a single MAP requires the same ADP capabilities as District, State and Bureau wide MAPs as required for Resource Area MAPs.

6.5 Land Records Management

c. Cadastral Survey Note Preparation

3. Publish

6.15 Environmental Analysis Report/Environmental Impact Statement (EAR/EIS) Preparation and Production

h. Document

1. Preliminary draft produced

3. Draft is produced

5. Final EIS produced

o SPECIAL PROCESSING

6.1 Resource Inventory

a. Field preparation

4. Determine the area's:

(a) Acreage

5. Establish a work plan including:

(c) Travel course to site

c. Interpretation and Analysis

3. Perform calculations using field collected data

6.2 Planning - Unit Resource Analysis (URA)

f. Analysis and recordation of resource capability and opportunity for development:

1. Analyze information in terms of perdicting full potential for each resource.

q. Preparation and recordation of Ecological Profile

6. Analyze ecological relationships to determine classification and trend ratings.

12. Analyze information to determine where class ratings can be improved.

6.3 Planning - Management Framework Plan (MFP)

a. Analysis and recommendation of optimum use for each of seven resources:

2. Analyze each resource for optimum use based on interaction of above data.

b. Identification, analysis, coordination and recordation of overlays and conflicts among resource activities:

1. Compare all activity recommendation areas for conflicts, overlays.

4. Verify consistency of multiple use recommendations.

6. Prepare narrative for each multiple-use recommendation.

6.4 Program Action Planning

d. Coordination and recordation of quantified data into a single integrated Resource Area MAP:

1. Coordination.

h. Assessment and recordation of program priorities

2. Recordation.

6.5 Annual Work Planning and Program Management

b. Preliminary AWP based on preliminary allowance:

1. Determination.

c. AWP based on approved funds:

1. Determination.

d. AWP:

1. Determination.

6.6 Financial Management - Accounting Fund Control

b. Provide coordinated control of funds for all program activities:

2. Analyze appreciation of funds.

6.7 Financial Management: Payroll

a. T&A

4. Calculate salary

b. T&A Analysis

1. Trend and pattern analysis

6.9 Case Management

o Caseflow

a. Initiation

7. Compute:

(a) Rent

(b) Acreage

o Appraisal

c. Perform companion analysis

6.10. Utilization Management

o Compliance checking

b. Inspect the site to:

1. Determine amount of material removed

6.11 Manpower and Organization Management

o Personnel Management

a. Manpower planning

2. Determine BLM workload

(b) Projected

4. Perform attrition analysis

5. Perform workload analysis

6. Evaluate programs

b. Manpower utilization

3. Analyze manpower correlation

5. Evaluate training utilization

o Organization Management

a. Planning

2. Evaluate against programs

b. Structure Alteration

1. Evaluate recommendations

6.12 Property Control and Management

o Stores and Equipment

b. Utilization and maintenance

2. Determine utilization and maintenance

o Real Property

d. Utilization

2. Determine utilization

e. Maintenance

1. Develop schedule

2. Monitor schedule

6.13 Protection

a. Preliminary Analysis

1. Determine costs:

(b) Process input control statements

(d) Process input data

(e) Generate cost configuration output

2. Evaluate effectiveness:

(b) Process input control statements

(d) Process

(e) Generate effectiveness configuration output

b. Prevention

2. Hazard assessment/control

(c) NFDR system tie-in

(e) Develop sign and posting plan

3. Weigh control against value threatened

4. Courses of action

6.14 Regional Analysis

b. Analysis of SED data

1. Review and analyze industrial relations

2. Review and analyze community relations

3. Determine estimated value of resources

4. Identify trends

5. Project:

(a) Resource production

(b) Income

(c) Employment

(d) Population

c. Prepare and maintain supporting documents

1. Depict interrelationships, trends, etc.

6.15 Environmental Analysis Report/Environmental Impact Statement (EAR/EIS) Preparation and Production

f. Evaluate potential impacts

Identify design mitigations

Re-evaluate potential impacts

Identify design/operational changes

Short/long term impacts

Alternative approaches

o IMAGE PROCESSING

6.1 Resource Inventory

a. Field preparation

3. Prepare type map of area

c. Interpretation and Analysis

4. Develop type map

6.13 Protection

d. Suppression

1. Access damage/effectiveness

(b) Interpret aerial photos

o COMPUTER ASSISTED TRAINING: REMOTE

6.1 Resource Inventory

a. Field preparation

5. Establish a work plan including:

(d) field collector training

6.2 Planning - Unit Resource Analysis (URA)

f. Analysis and recordation of resource capability and opportunity for development:

2. Analyze information in terms of predicting full potential for each resource.

g. Preparation and recordation of ecological profile:

12. Analyze information to determine where class ratings can be improved.

6.3 Planning - Management Framework Plan (MFP)

b. Identification, analysis, coordination and recordation of overlays and conflicts among resource activities:

1. Compare all activity recommendation areas for conflicts, overlays.

6.4 Program Planning

d. Coordination and recordation of quantified data into a single integrated Resource Area MAP:

1. Coordination.

6.5 Annual Work Planning and Program Management

a. AWP advises:

1. Determination.

6.6 Financial Management - Accounting Fund Control

a. Meet the requirements of various concerned bureaus, departments and Congress:

1. Accounting.

o DATA BASE CONVERSION

6.1 Resource Inventory

a. Field preparation

2. Assemble the selected area's

(c) Previous survey results

c. Interpretation and Analysis

2. Store/impact field collected data

6.5 Annual Work Planning and Program Management

f. Operating budget:

1. Maintenance.

6.7 Financial Management: Payroll

a. T&A

5. Produce reports

b. T&A Analysis

2. Produce reports

6.9 Case Management

o Caseflow

b. Preadjudication

4. Examine other application for conflicts

o MICROFILM

6.9 Case Management

o Caseflow

a. Initiation

4. Assemble

(b) Supporting papers

b. Preadjudication

2. Examine supporting papers

5.3 LINE CONSIDERATIONS

5.3.1 BLM Network

In considering communication channels for the BLM network, there are two basically different ranges offered by the common carriers. One is commonly referred to as Public or Exchange Service. It consists of subscriber lines connected to a common system often called a "switching" system. It's "public" title manifests itself in the sense that all customers are connected to the same system. On the other hand, the "exchange" appellation came about from the fact that calls are placed by the originator and the connection lasts only as long as required. The cost of this type of Exchange Service consists of tolls based on distance and length of connection (time), and a monthly service charge to maintain system access.

In ADP teleprocessing there are advantages and disadvantages to this type of service. As alluded to in the "Hardware" section, it would be convenient to have alternate paths of communication between the district TCU's and the state CC's. The idea of any TCU to any CC has great appeal from a pure sense of network reliability. Why should all the Arizona districts be inoperative because of the malfunctioning communication controller at Phoenix? In an Exchange Service environment all the TCU's in Arizona would have access to the Denver Computing Center via adjacent state CC's and overall network service interruption would be minimized at all times.

The disadvantages, which are discussed in the following paragraphs, far out-weigh this one argument for Public Lines and alternative methods of securing reliability have to be considered. The other range to be considered is the Private Line Service or Channels which consist of full time leased point-to-point or multipoint lines connecting only the locations (district and state offices) belonging to the Bureau. Usually, the cost of a Private Line of this sort consists of monthly rental based on length and type of lines. These Private Lines - also referred to as Leased Lines - connections are dedicated and communications are, therefore, only between points connected to the same line. Such lines may be interconnected by switching equipment to provide a private version of an Exchange System but this capability may be of little value to the BLM network.

This Private Line Service has several important advantages for data transmission over the Public Service discussed earlier. These range from cost considerations to availability of service to reliability of data .... a reduction in the number of data errors. Let us consider each of these.

If a leased line is to be used more than a given number of hours per day, it is less expensive than a dial-up or Public Service. The attached charts (Figures 5-1 through 5-10 in Section 5.3.3) identifies the break even points which are based on actual charges which, in turn, were based upon the calculated mileage between facilities. Interstate and intrastate tariffs were taken into consideration. The acutal mileage was based on the centralized network configuration with the CC's located at the state offices. It should be clearly noted that this placement of CC's does not render this network as an optimum configuration from a cost standpoint. The ideal network would centrally locate the CC's considering how many separate lines a particular CC could support, so as to minimize the line lengths from the districts to the CC's and from the CC's to Denver. The recommended network provides the foundation for intrastate data communications when and if some intelligence is installed at the state office. Other factors have to be considered and these are based on internal BLM decisions and the vendor hardware selected. Finally, based on the anticipated line traffic for the BLM network, a leased, conditioned (Private Service) line could be cost justified.

The Private Lines (unlike Public Lines) can be specially treated by carriers (AT&T, etc.) or "conditioned" to compensate for distortion that is occasionally encountered in the transmission of data. In this way the number of errors is significantly reduced and higher transmission rates are possible since the number of data errors is directly proportional to the transmission rate. The switched connections cannot be treated similarly beforehand because the path the circuit will take is never predetermined. Dialing one time is likely to set up a quite different physical path to the same destination than dialing at another time, and the number of available paths is quite large. Most carriers charge a separate (and higher) tariff for conditioned lines but, again, the additional charge is justifiable if one is to use anything over 2000 Baud lines.

The Leased Line is also less prone to data errors because line perturbation and distortion is not as prevalent in this type of hook-up. The switching gear can cause impulse noise which, in

turn, causes data errors. Public Lines often go through several of these switching boxes between origination and destination as the system searches for open lines to make the necessary connection.

This brings about a third advantage of the leased (Private) over the dial-up (Public) line. We often encounter the "busy" line in our day-to-day telephoning. It is conceivable that a BLM dial-up system referred to as the "minimal system," would be faced with busy lines and the inherent delays associated with them. If a district TCU could not establish connection to one of the CC's in the network, that district office would have to wait to begin using its terminals. In light of this disadvantage, the Bureau should not consider the Public Service unless this type of delay is tolerable.

Another possible consideration is the use of the Federal Telecommunications System (FTS) or the Wide Area Telephone Service (WATS). Both of these options provide similar advantages and disadvantages as the Public Line Service discussed earlier. The FTS possibilities may be deminished by the current usage rate of FTS (lines are often busy) and the reluctance on the part of the controlling agency to allow the use of FTS in an ADP/Network kind of environment.

The WATS facility is a special arrangement with regard to both the access to the telephone system and the charges for using it. WATS is offered on an interstate basis by AT&T and nearly all other United States telephone companies. It is offered, separately, on an intrastate basis in almost every state by the Bell System companies and nearly all other connecting companies.

A WATS access line user is permitted to place as many calls as desired, lasting as long as desired, to all the stations (e.g.; any district terminal control unit to any state communications controller) in specified geographical areas. The charges to the Bureau for this type of facility would either be a flat monthly rate or a fixed hourly rate with a monthly number of hours free.

Many other "line possibilities exist but none of these options quite fit the BLM requirements. Figure 1 lists three possible approaches to satisfying the BLM network requirements. While the "future system" cannot be justified under current traffic figures and response requirements, the eventuality of a system with such

extensive communication power should not be precluded by current considerations..

Figure 1. Network Options

From Denver	Minimal	Recommended	Future	Comments
To States (CC's)	4800 HDX L/C	9600 FDX L/C	50KB Satellite Channel	L = Leased private line C = Conditioned line
To Washington, D.C. (CPU or CC)	4800 HDX L/C	9600* FDX L/C	50KB Satellite Channel	*Could also be satellite channel
To Anchorage, Alaska (CPU or CC)	4800 HDX L/C	9600 HDX L/C	50KB Satellite Channel	Note: All HDX lines may be FDX
To Boise, Idaho (CPU)	4800 HDX L/C	9600* FDX L/C	50KB Satellite Channel	*Could also be satellite channel
From Santa Fe, N.M. to New Orleans (OCS, TCU)	4800 HDX L/C	4800** HDX L/C	9600** HDX L/C	**Dual communication controllers may be necessary to provide backup
From States to Districts, ESO, and Other OCS's (TCU's)	2400 HDX Dial-up	4800** HDX L/C	9600** HDX L/C	**Dual communication controllers may be necessary to provide backup

Alternative configurations exist and should be given careful consideration by the Bureau. The two detailed in Figures 2 and 3 provide only a few of the options available to reduce line cost and provide added system reliability.

Figure 2. State to District Configurations

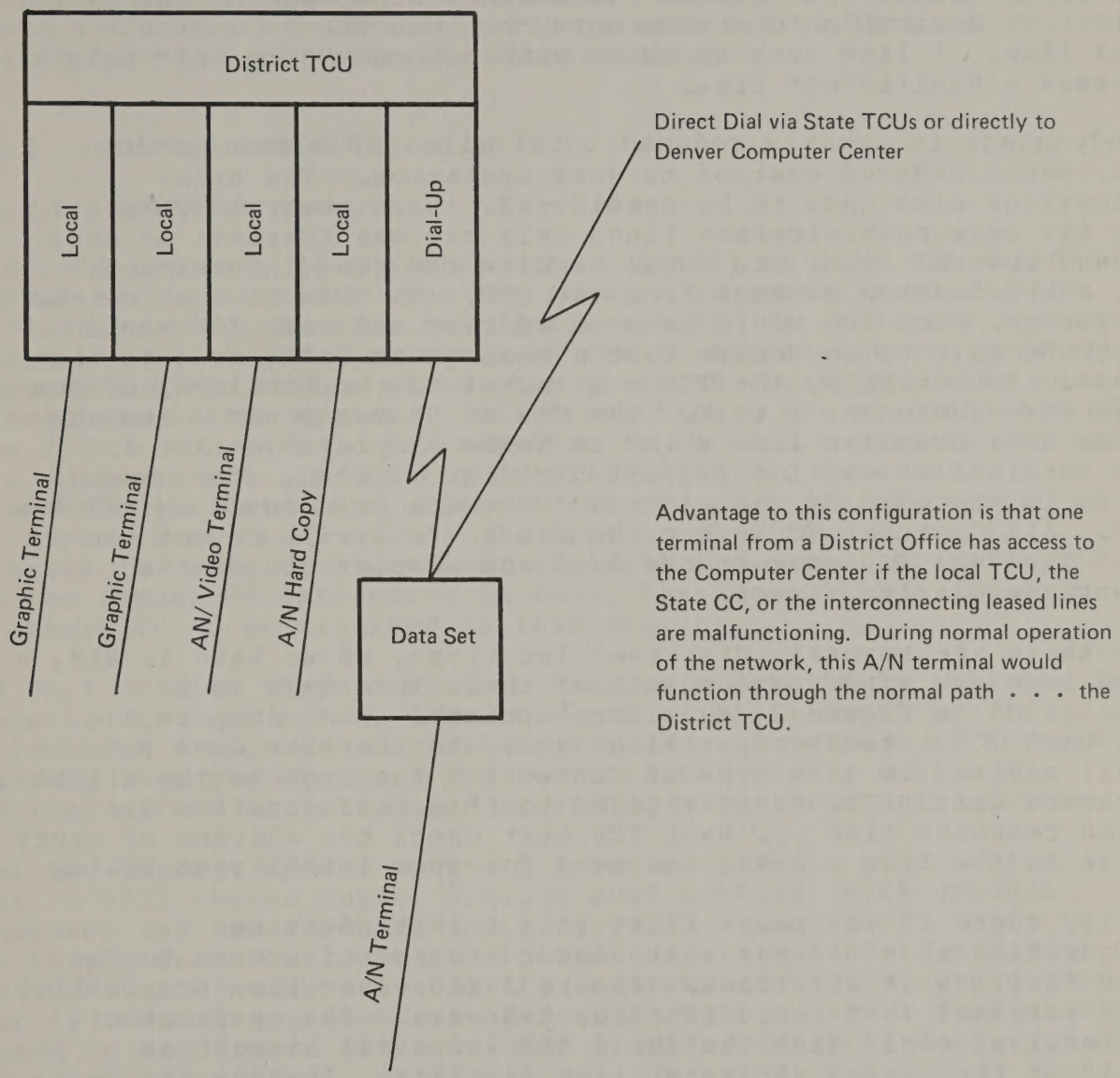

District TCU
Local
Local
Local
Local
Dial-Up
Direct Dial via State TCUs or directly to Denver Computer Center
Graphic Terminal
Graphic Terminal
AN/ Video Terminal
A/N Hard Copy
Data Set
A/N Terminal
Advantage to this configuration is that one terminal from a District Office has access to the Computer Center if the local TCU, the State CC, or the interconnecting leased lines are malfunctioning. During normal operation of the network, this A/N terminal would function through the normal path . . . the District TCU.

Figure 3. Optional District Configurations

In order to reduce the cost of the network of communication lines, it might be desirable to attach more than one TCU to a single leased line. A line such as this, with several "drop-off" points is termed a "multidrop" line.

The advantage is greatly reduced total miles of communication lines, hence reduced cost of network operation. The other implications also have to be considered. When several TCU's all share the same communication line, only one can transmit at once, although several districts could receive the same information; e.g., a broadcasted message from the CPU. In this kind of set-up (multidrop), each TCU would have an address and each TCU would have to be able to recognize that a message is being sent to that address. For example, the TCU's attached to the Portland, Oregon CC may have addresses A to K. The CPU at Denver sends a message or some data down the line which is to be displayed on the A/N Video terminal at station H (Vail District office). The message or data is preceded by the address "H" which is scanned by all the TCU's. All district TCU's but the one at Vail will reject the data. The Vail TCU accepts the data and displays it on the appropriate display screen.

Where there are several, dispersed locations, as we have in BLM, a leased line may wander around all of these locations as is demonstrated in Figure 2 (multidrop option). Each drop in the line, each TCU attachment, will be added to the line cost but the overall savings in this type of connection far exceeds the slight attachment cost. The disadvantages to this configuration are reduced response time .... each TCU must check the address of every message on the line .... and the need for more intelligent TCU's.

Finally, there is the possibility in a Private Service configuration that BLM may want some guarantee of access to the Denver facility at all times. Figure 3 addresses that possibility with a terminal that could function two ways. The operator of that terminal could dial the local TCU and avail himself or herself of the leased (Private) line facility. In addition, should that path be hampered with some sort of malfunction, the terminal operator could use the Public Line facility to access the network and the Denver Computing Center. This type of terminal attachment and operation would have to be controlled however. Excessive use of the direct dial facility (bypassing the TCU and the leased lines) would result in increased cost of operation as was discussed earlier in considering Public Service lines.

The establishment of a network for the Bureau, and the type of network selected will depend on three factors: (1) network costs (lines and control equipment), (2) network reliability and availability and (3) network responsiveness.

5.3.2 Data Set Activity

5.3.2.1 Introduction

An effort was made to establish the quantity of data BLM would be transmitting each month when the network is established and the application programs have been implemented. The activity against a data set is measured in terms of the number of updates performed (inputs) and the number of reports produced (outputs) using an interactive online system. Inputs constitute the transmission of data from a terminal to the computer to be used to update the data set. Outputs are produced by interrogating the data set, formatting the data into a report and transmitting the report to the appropriate terminal. It is this transmission of data, measured in terms of the number of input and output transactions and the number of characters in each, that constitutes the data set activity to be examined in this section.

The unit of time that is used to measure a data set's activity is a month. Certain hours, days or weeks within a month may be busier than others causing distinct peaks and valleys of activity. However, when the requests are consolidated over a month, a settling effect is introduced providing a workable unit of time.

When the monthly update activity is traced over a period of a year, a bell shaped curve, i.e., a peak month(s) with gradual increases and decreases in activity, will be observed. This is due to the fact that certain disciplines are seasonal or depend on the weather. The output activity however, is evenly spread over a year by recurring production of regular reports and a predictable (based on experience and knowledge of BLM personnel) number of ad hoc report requests.

Because of this difference in activity and distribution rates between inputs and outputs, they will be discussed seperately. The results of the analysis, however, revealed that the most active month involved an estimated 21,510 update transactions and 171,033 data accesses for an activity total of 192,543 messages. The total number of characters that would be transmitted during

the most active month was 5,791,322,382 divided into 168,907,450 characters input and 5,622,414,932 characters output.

This is the most active month and the system must be able to transmit the maximum anticipated number of transactions and characters indicated to be of use of BLM. Of course, the different application areas that update or access the data sets can be examined in more detail to determine if a further equal spreading effect can be achieved.

5.3.2.2 Table Descriptions

The volume/frequency of inputs and references and the logical record lengths from Table 5-1 or each data set were examined. This information, along with knowledge of BLM procedures, was used to estimate a data set's activity.

5.3.2.2.1 Inputs

The following input charts contain columns of information depicting the number of update transactions and characters transmitted each month. This information is required to establish the busiest month.

Data Sets	Average No./Period	Period	Distribution	Offices	Total/Period	Average Trans. Size
Vegetation:						
Forage	100	Jan-Aug	Bell curve	61	6,100	25K 180
Trees	370	Sep-Dec	Bell curve	38	14,000	25K 90
Soils	2	Sep-Nov	Bell curve	61	122	25K 160
Minerals	2	Sep-Nov	Bell curve	61	122	25K 140
Geologic	2	Sep-Nov	Bell curve	61	122	25K 210
Water	100	Jan-Aug	Bell curve	61	6,100	15K 120
Wildlife	4	Jan-Dec	Bell curve	61	244	25K 2000
Meteorology	180	Jun-Oct	=	12	2,160	25K 70
Recreation	50	Jan-Dec	=	61	3,050	25K 300
Cultural	1	Sep-Nov	Bell curve	61	61	25K 160
Land Records	50	Jan-Dec	Bell curve	12	600	600
Case File	14,000	Jan-Dec	=	11	158,400	1000
Socio-Econ	1	Jan-Dec	=	16	16	1200
A & FC	260	Jan-Dec	=	80	20,800	2000
Protection	190	Jan-Dec	Bell curve with emphasis on Jun-Nov	61	11,590	600
M & O	52	Jan-Dec	=	80	4,160	300
Payroll	26	Jan-Dec	=	80	2,080	1400
Property	26	Jan-Dec	=	80	2,080	400
Text	12	Jan-Dec	=	1	12	750
URA	100 2	Jan-Dec	=	61	6,100 122	25K 4600
MFP	50 2	Jan-Dec	=	61	3,050 122	25K 9200
Program Plan	1	Jan-Dec	=	80	80	9200
Budget	1	Jan-Dec	=	80	80	9200

Chart 1. Input

a. Chart 1 has the following columns:

1. The data sets are listed in the first column. Because of their diverse nature, the logical records in the vegetation data set are presented seperately.

2. The average number of update transactions a data set experiences during a given period is presented next. The URA counts reflect the fact that the 2 URAs have 50 overlays each and the MFP counts indicate 25 overlays for each MFP.

3. The months (period) in which the particular activity occurs during the year is presented in the Period column; the standard month abbreviations are used.

4. The activity distribution during the period is presented in the Distribution column. The entry of data may be constant throughout the period and be indicated by an equal sign#(=) or scattered during the period and indicated by the phrase "bell curve". This is because data may be collected during the in season months and entered during the off season months or entered as it is collected throughout the period.

5. The number of BLM offices that currently provide information for a particular data set is contained in the Office column. The current BLM configuration of 12 States, 60 Districts, 4 OCS offices, 1 ESO, 1 DSC, 1 BIFC and 1 headquarters office was used. Individual office considerations and needs were taken into account to produce the counts.

6. The Total/Period column was computed by multiplying the average number of transactions per period by the number of BLM offices that provide the data. The result is the total BLM activity for the period in a particular data set. A monthly distribution of this figure is present in Chart 2 which is presented later in this section.

7. The Average Transaction Size column contains the number of characters in an average transaction. This column will have two entries when the data set

is associated with overlays. The overlays will always require 25,000 (25K) characters. The number of input characters per update transaction, based on the average logical record size in Table 5-1, is presented in this column.

The interactive online input transaction will be a "fill-in-the-blanks mult iple choice" type that allows for all data. This data is edited and errors corrected immediately so that a correct transaction is transmitted. A monthly distribution of these figures is presented in Chart 3 which is presented later in this section.

b. The Total/Period column form Chart 1, along with the Period and Distribution columns were used to generate Chart 2. The data sets are listed on the left and the distribution of activity computed and spread over the months. The URA and MFP data sets have two entries, narratives and overlays, because there is not a one-for-one relationship of URA/MFP narratives to overlays like there is for the resource data sets. In computing monthly distribution, only whole numbers were used.

Chart 2. Distribution of Input Transactions

Data Sets	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Vegetation:												
Forage	488	671	854	1,037	1,037	854	671	488				
Trees									2,800	3,500	4,900	2,800
Soils									31	61	30	
Minerals									31	61	30	
Geology									31	61	30	
Water	488	671	854	1,037	1,037	854	671	488				
Wildlife	2	10	17	24	32	37	37	32	24	17	10	2
Meteorology						432	432	432	432	432		
Recreation	254	254	254	254	254	254	256	254	254	254	254	254
Cultural									16	30	15	
Land Records	6	24	42	60	76	91	91	76	60	42	24	6
Case File	13,200	13,200	13,200	13,200	13,200	13,200	13,200	13,200	13,200	13,200	13,200	13,200
Socio-Econ	1	1	1	1	2	2	2	2	1	1	1	1
A & FC	1,733	1,733	1,733	1,733	1,734	1,734	1,734	1,734	1,733	1,733	1,733	1,733
Protection	570	570	580	580	590	1,134	1,512	2,268	1,512	1,134	570	570
M & O	346	346	347	347	347	347	347	347	347	347	346	346
Payroll	173	173	173	173	174	174	174	174	173	173	173	173
Property	173	173	173	173	174	174	174	174	173	173	173	173
Text	1	1	1	1	1	1	1	1	1	1	1	1
URA												
Narr	10	10	10	10	10	11	11	10	10	10	10	10
Overlay	508	508	508	508	509	509	509	509	508	508	508	508
MFP												
Narr	10	10	10	10	10	11	11	10	10	10	10	10
Overlay	254	254	254	254	254	255	255	254	254	254	254	254
Prog.Plan	40											40
Budget							80					
	17,495	17,847	18,249	18,640	18,678	19,310	19,404	19,690	20,839	21,240	21,510	19,319

When the Distribution column indicated an equal distribution, the total number of transactions was divided by the appropriate number of months and spread over the period. For example, the meteorology data set has a total of 2,160 transactions that are to be spread over a five month period. By dividing 2,160 by 5, the 432 result will be entered in each of the JUN through OCT columns.

When the Distribution column indicated a bell curve distribution, the transaction percentage for each month was computed and applied against the total number of transactions. For example, the forage portion of the vegetation data set's transaction total of 6,100 is to be divided over an 8 month period in a bell shaped curve. The percentage for each month was computed as 8, 11, 14, 17, 17, 14, 11 and 8. These percentages, when multiplied against the 6,100 transaction total, produced the numbers shown.

After all the distributions were made for all data sets, each monthly column was totalled. The most active month was November with 21,510 transactions.

The average transaction size column from Chart 1 along with the percentage distribution figures computed for use in Chart 2 will be used to generate Chart 3. The data sets are listed on the left and will have two entries when the data set is associated with overlays. The distribution of characters is computed and spread over the months. Each month's column is totalled with the most active month being November with 168,907,450 characters.

Chart 3. Distribution of Input Characters.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Vegetation:												
Forage												
Attribute	87,840	120,780	153,720	186,660	186,660	153,720	120,780	87,840				
Overlay	12,200,000	16,775,000	21,350,000	25,925,000	25,925,000	21,350,000	16,775,000	12,200,000				
Trees												
Attribute									252,000	315,000	441,000	252,000
Overlay									70,000,000	87,500,000	122,500,000	70,000,000
Soils												
Attribute									4,960	9,760	4,800	
Overlay									775,000	1,525,000	750,000	
Minerals												
Attribute									4,340	8,540	4,200	
Overlay									775,000	1,525,000	750,000	
Geology												
Attribute									6,510	12,810	6,300	
Overlay									775,000	1,525,000	750,000	
Water												
Attribute	58,560	80,520	102,480	124,440	124,440	102,480	80,520	58,560				
Overlay	12,200,000	16,775,000	21,350,000	25,925,000	25,925,000	21,350,000	16,775,000	12,200,000				
Wildlife												
Attribute	4,000	20,000	34,000	48,000	64,000	74,000	74,000	64,000	48,000	34,000	20,000	4,000
Overlay	50,000	250,000	425,000	600,000	800,000	925,000	925,000	800,000	600,000	425,000	250,000	50,000
Meteorology												
Attribute						30,240	30,240	30,240	30,240	30,240		
Overlay						10,800,000	10,800,000	10,800,000	10,800,000	10,800,000		
Recreation												
Attribute	76,200	76,200	76,200	76,200	76,200	76,200	76,800	76,200	76,200	76,200	76,200	76,200
Overlay	6,350,000	6,350,000	6,350,000	6,350,000	6,350,000	6,350,000	6,400,000	6,350,000	6,350,000	6,350,000	6,350,000	6,350,000
Cultural												
Attribute									2,560	4,800	2,400	
Overlay									400,000	750,000	375,000	
Total												
Attribute	223,000	297,500	366,400	435,300	451,300	436,640	382,340	316,840	424,810	491,350	554,900	332,200
Overlay	30,800,000	40,150,000	49,475,000	58,800,000	59,000,000	60,775,000	51,675,000	42,350,000	90,475,000	110,400,000	131,725,000	76,400,000
Total	31,023,000	40,447,500	49,841,000	59,235,300	59,451,300	61,211,640	52,057,340	42,666,840	90,899,810	110,891,350	132,279,900	76,732,200
Land Records	1,200	14,400	25,200	36,000	45,600	54,600	54,600	45,600	36,000	25,200	14,400	1,200
Case	13,200,000	13,200,000	13,200,000	13,200,000	13,200,000	13,200,000	13,200,000	13,200,000	13,200,000	13,200,000	13,200,000	13,200,000
Socio-Econ	1,200	1,200	1,200	1,200	2,400	2,400	2,400	2,400	1,200	1,200	1,200	1,200
A & FC	3,466,000	3,466,000	3,466,000	3,466,000	3,468,000	3,468,000	3,468,000	3,468,000	3,466,000	3,466,000	3,466,000	3,466,000
Protection	342,000	342,000	348,000	348,000	354,000	680,400	907,200	1,360,800	907,200	680,400	342,000	342,000
M & O	103,800	103,800	104,100	104,100	104,100	104,100	104,100	104,100	104,100	104,100	103,800	103,800
Payroll	242,200	242,200	242,200	242,200	243,600	243,600	243,600	243,600	243,600	243,600	242,200	242,200
Property	69,200	69,200	69,200	69,200	69,200	69,200	69,200	69,200	69,200	69,200	69,200	69,200
Text	750	750	750	750	750	750	750	750	750	750	750	750
URA												
Narrative	46,000	46,000	46,000	46,000	46,000	50,600	50,600	46,000	46,000	46,000	46,000	46,000
Overlay	12,700,000	12,700,000	12,700,000	12,700,000	12,725,000	12,725,000	12,725,000	12,725,000	12,700,000	12,700,000	12,700,000	12,700,000
MFP												
Narrative	92,000	92,000	92,000	92,000	92,000	101,200	101,200	92,000	92,000	92,000	92,000	92,000
Overlay	6,350,000	6,350,000	6,350,000	6,350,000	6,350,000	6,375,000	6,375,000	6,350,000	6,350,000	6,350,000	6,350,000	6,350,000
Program Plan	368,000											368,000
Budget							736,000					
Total	68,005,150	77,075,050	86,486,050	95,890,750	96,152,350	98,286,890	90,095,390	80,374,690	128,115,860	147,869,800	168,907,450	113,714,550

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5.3.2.2.2 Outputs

The following output charts contain columns of information depicting the number of accesses and characters transmitted each month. This information is used to establish BLM's most active month. Chart 4 has the following columns:

a. The data sets are listed in the first column. Because of their diverse nature, the logical records in the vegetation data set are presented separately.

b. The average number of accesses a data set experiences during a period if presented.

c. The months (period) in which the particular activity occurs during the year is constant and therefore, the term monthly will appear in the Period column.

d. The activity distribution during the period is presented in the Distribution column. Since the period is already monthly, the access of data is constant and will be indicated by the word EVFN. The Program Planning and Budget data sets are accessed equally throughout the period and will be indicated by an equal sign (=).

Data Sets	Average No./Period	Period	Distribution	Office	Total/Period	Average Trans Size	Char./Period
Vegetation: Forage	278	monthly	even	11	3,058	25K 200	76,450,000 611,600
Trees	278	monthly	even	11	3,058	25K 200	76,450,000 611,600
Soils	260	monthly	even	11	2,860	25K 200	71,500,000 572,000
Minerals	101	monthly	even	11	1,111	25K 200	27,775,000 222,200
Geologic	278	monthly	even	11	3,058	25K 200	76,450,000 611,600
Water	378	monthly	even	11	4,158	25K 200	103,950,000 831,600
Wildlife	278	monthly	even	11	3,058	25K 200	76,450,000 611,600
Meteorology	60	monthly	even	11	660	25K 200	16,500,000 132,000
Recreation	40	monthly	even	61	2,440	25K 200	61,000,000 488,000
Cultural	350	monthly	even	11	3,850	25K 200	96,250,000 770,000
Land Records	1700	monthly	even	11	18,700	200	3,740,000
Case File	1200	monthly	even	11	13,200	200	2,640,000
Socio-Econ	1700	monthly	even	11	18,700	200	3,740,000
A & FC	1800	monthly	even	11	19,800	200	3,960,000
Protection	278	monthly	even	11	3,058	200	611,600
M & O	300	monthly	even	80	24,000	200	4,800,000
Payroll	48	monthly	even	80	3,840	200	768,000
Property	20	monthly	even	80	1,600	200	380,000
Text	1700	monthly	even	80	18,700	200	3,740,000
URA	278	monthly	even	80	3,058	25K 200	76,450,000 611,600
MFP	1700	monthly	even	80	18,700	25K 200	4,675,000,000 3,740,000
Program Plan	5	yearly	=	80	400/12=33	200	6,600
Budget	4000	yearly	=	WO	4,000/12=333	200	66,600
OUTPUT					171,033		5,622,414,932
INPUT					21,510		168,907,450
TOTAL/MONTH					192,543 transactions		5,791,322,382 characters

Chart 4. Output

Two exceptions are the Program Planning and Budget data sets whose activity is yearly. The number of BLM offices that currently use information for a particular data set is contained in the office column. The current BLM configuration of 11 States, 61 Districts, 4 OCS offices, 1 ESO, 1 DSC, 1 BIFC and 1 headquarters office was used. Individual office considerations and needs were taken into account to produce the counts.

The total/period column was computed by multiplying the average number of transactions per period by the number of BLM offices that provide the data. The result is the total BLM activity for the month in a particular data set. Since the period is monthly, no further calculations were required except Program Planning and Budget data set counts, which were divided by 12 to get an even monthly distribution. The column was then totalled to obtain the number of accesses that can be expected by BLM during a month for all data sets. The peak month from Chart 2 was then added to this total to obtain the total input and output activity BLM will experience in all of its data sets.

The Average Transaction Size column contains the number of characters in an average transaction. The column will have two entries when the data set is associated with overlays. The overlays will always require 25,000 (25K) characters. The number of access characters is estimated to be an average of 200 per transaction.

The Characters/Period column is merely the result of multiplying the number in the Total/Period column times the number in the Average Transaction Size column. The column is then totalled to obtain the number of output characters BLM offices will transmit each month.

The number of input characters in the peak month from Chart 3 is then added to the number of output characters to obtain the total amount of character traffic BLM will experience in the most active month.

5.3.2.3 Conclusion

This data provides the Bureau with a rather detailed analysis of the anticipated traffic over its network. In planning for the eventual development of a total, centralized teleprocessing system, BLM will have to project these figures to cover

anticipated growth. Planners will have to select line speeds, line types, and line conditioning as well as select optimum locations for communication devices (concentrators and control units) to handle projected peak data loads, as indicated in the charts, over the communication facilities. Any analysis of the future network requirements and any plans for network implementation should use these figures as a basis to achieve those ends.

5.3.3 Teleprocessing Communications Network

5.3.3.1 General

In order to provide a basis for determination of communications equipment requirements and to estimate costs of communications lines obtained from common carriers, a communications network was selected which corresponds to the functional organization and geographic dispersion of state and local offices of BLM. Detailed calculations were then performed to obtain estimates of monthly line costs at three levels of transmission line characteristics, and additional evaluations were performed on simplified networks to provide information on the relative cost-effectiveness of remote line concentrators at various locations, i.e., Communications Control Units located at state-level offices, excluding the one co-located with the data processing center at Denver.

The costs for communications services provided by the common caarriers are estimated values only, to be used solely for preliminary planning purposes. Precise cost information can only be obtained from the common carriers directly involved in providing the required communications services. Cost figures employed in this analysis were obtained from published information pertaining to interstate and intrastate tariffs of members of the Bell Telephone System. This information was also used to approximate costs of services which would be secured from RCA Alaska Communications, Inc., who provide comparable services both within the state of Alaska as well as between Alaska and International Boundary Points of the Bell Telephone System in the continental United States.

5.3.3.2 Communication Lines Cost Analysis

The teleprocessing network configured for line costs analysis consists of terminals at BLM offices 71 cities in the continental United States and Alaska, communicating with the data processing center at Denver, Colorado. Every terminal is directly linked to one of the communications control units located at each of the 11 state offices and Washington, D. C. Each communications controller has a direct link to the Denver facilities, and acts as a line concentrator for all transactions originating from or directed to any of its directly attached terminals (ref. Table 5-2).

State Office	Corresponding Local Offices	
Anchorage, AK	Fairbanks, AK	
Phoenix, AZ	Safford, AZ	St. George, UT
	Yuma, AZ	
Sacramento, CA	Bakersfield, CA	Riverside, CA
	Folsom, CA	Susanville, CA
	Los Angeles, CA	Ukiah, CA
	Redding, CA	
Denver, CO	Canon City, CO	Grand Junction, CO
	Craig, CO	Montrose, CO
Washington, DC	New York City, NY	
Boise, ID	Burley, ID	Salmon, ID
	Coeur d'Alene, ID	Shoshone, ID
	Idaho Falls, ID	
Billings, MT	Dillon, MT	Miles City, MT
	Lewistown, MT	Missoula, MT
	Malta, MT	
Reno, NV	Battle Mountain, NV	Ely, NV
	Carson City, NV	Las Vegas, NV
	Elko, NV	Winnemucca, NV
Santa Fe, NM	Albuquerque, NM	Socorro, NM
	Las Cruces, NM	New Orleans, LA
	Roswell, NM	
Portland, OR	Baker, OR	Prineville, OR
	Burns, OR	Roseburg, OR
	Coos Bay, OR	Salem, OR
	Eugene, OR	Vale, OR
	Lakeview, OR	Spokane, WA
	Medford, OR	
Salt Lake City, UT	Cedar City, UT	Price, UT
	Fillmore, UT	Richfield, UT
	Kanab, UT	Vernal, UT
	Monticello, UT	
Cheyenne, WY	Casper, WY	Rock Springs, WY
	Rawlins, WY	Worland, WY

Table 5-2 Teleprocessing Network Terminal Locations

Three levels of line performance parameters were selected to obtain cost estimates over a wide range of operating capabilities, and were designated as the minimum, recommended and future levels of transmission requirements. (ref. Table 5-3). Voice grade lines with half-duplex transmission capacities up to 2400 BPS (bits per second) may be obtained by using dial-up lines (DDD), wide area telephone service (WATS), or by leased lines. Higher capacity voice grade lines (up to 10,000 BPS) are leased half- or full-duplex lines with C2 conditioning. Wideband grade leased lines permit data transmission at speeds up to 50,000 BPS. Estimated costs used in this analysis reflect the lowest cost service available for 2400 BPS half-duplex voice grade transmission, and include conditioning costs for higher speed voice grade leased lines. No charges for any other common carrier services or equipment, such as data sets or modems, are included in the analysis and costs developed in this section.

Communications Link	Transmission Line Capabilities		
	Minimum	Recommended	Future
Denver/Anchorage	4800 HDX (Leased-C2)	9600 HDX (Leased-C2)	50K (Leased)
Denver/Other States and DC	4800 HDX (Leased-C2)	9600 HDX (Leased-C2)	50K (Leased)
Santa Fe, NM/New Orleans, LA	4800 HDX (Leased-C2)	4800 HDX (Leased-C2)	9600 HDX (Leased-C2)
States and DC/Local Offices	2400 HDX	4800 HDX (Leased-C2)	9600 HDX (Leased-C2)

Table 5-3 TP Network Performance Parameters

Each link of the communications network was first identified as being subject to either intrastate or interstate tariffs. For voice grade leased lines, transmission rates up to 10,000 BPS are obtained solely as an increasing function of modem costs (not included in this section), although type C2 line conditioning is generally required for rates in excess of 2400 BPS. For the minimum capability of 2400 BPS half-duplex lines from terminals in local offices, requirements may be satisfied by direct-distance-dialing (DDD), wide area telephone service (WATS), or voice grade leased lines. Since most of these links are covered by intrastate tariffs which vary from state to state, a separate analysis was required, by state, for every connected terminal. Each analysis (ref. Figures 5-1 to 5-10) compared the costs of DDD and WATS service at both 1/6 and 1/3 utilization (10 and 20 minutes per normal working hour, respectively) with leased line costs, as a function of the length in miles of the communications link. (DDD costs shown were based on interstate tariffs, which tend to be equal to or slightly less than intrastate tariffs.) In general, the analysis showed WATS or leased line, depending on the distance involved, to be lower cost than DDD service for anything other than extremely low line utilization. Accordingly, line costs for 2400 HDX service were selected as the lesser of leased line or full WATS service charges. The results of the analyses for each level of transmission capability are presented in Table 5-4.

Communications Links	Transmission Line Capabilities		
	Minimal	Recommended	Future
Denver/States and DC (11 lines)	10,600	11,400	93,300
States and DC/Local Offices (59 lines)	82,900	36,200	36,200
Totals ($/Month)	39,500	47,500	129,500

Table 5-4 Estimated Monthly Line Costs

These estimated monthly costs represent an upper limit, as several possibilities exist for obtaining some reduction in total operating costs. These lower costs could come about by securing more favorable tariffs for transmission lines, and might be further improved by optimizing the relative expense for communications lines and remotely located line concentrators.

The HILO tariff can be applied to traffic using voice grade lines and traveling along established high density routes. In some cases, it may prove advantageous to use less than direct routing for specific links to derive maximum benefits from these special rates. Additional savings might be obtained by employing a new Bell System facility which will be available in the near future, called Dataphone Digital Service. DDS will provide special facilities and tariffs for transmission of digital data between numerous cities. The last source of more favorable tariffs would be through securing communications lines at government discount rates as provided by the GSA.

5.3.3.3 Remote Line Concentation Optimization

While the communications network configuration in the previous section provides maximum flexibility and growth potential, the relatively low ratio of terminals to line concentrators suggests that it may be more cost-effective to reduce the number of remotely located communication control units.

To evaluate the potential effect of the line concentrators, additional cost calculations were performed on another network configuration where every terminal was directly linked to the data processing center at Denver. Transmission characteristics for each terminal were the same as in Table 5-3, and the same procedure was employed as in the previous section to obtain corresponding line costs. Results of this analysis are compared to the original network and presented in Table 5-5, and show that the additional line concentrators required for remote usage provide average incremental saving in line costs of $1500 to $2000/month. Concentrator line capacities used in this analysis are shown in Table 5-6. Lines of diferent capacity may be connected to the same concentrator as long as equivalent resource limitations are satisfied, i.e., 1/25 of a line concentrator/attached 4800 BPS line, etc.

Configuration	Transmission Capabilities		
	Minimum	Recommended	Future
No Remote Line Concentrators			
Total Concentrators Required	2	4	8
Monthly Line Costs ($)	58,200	61,400	143,300
Remote Line Concentrators			
Total Concentrators Required	12	13	15
Monthly Line Costs ($)	39,500	47,600	129,500
Reduction in Monthly Line Costs ($)	18,700	13,800	13,800
Average Monthly Saving/Concentrator ($) (Concentrator Costs Not Included)	1,900	1,500	2,000

Table 5-5. Comparison to Original Network

Line Speed (BPS)	Maximum Lines/Concentrator
2400	51
4800	25
9600	12
50K	4

Table 5-6. Concentrator Line Capacities

While it is convenient to compute the average dollar saving per concentrator, as in Table 5-5, the normal expectation would be for maximum incremental saving with the first remote line concentrator, and decreasing savings for each additional unit. Moveover, state office without a communications control unit could probably be adequately served with reduced transmission capacity. To further explore the potential effects of optimized concentrator location, a patametric evaluation of a simplified network configuration was performed to provide additional insight to the problem.

The line concentrator analysis was based on the continental United States portion of the BLM teleprocessing network, and interstate leased line tariffs were used for all communications links. Transmission capacity requirements were simplified to two levels, terminal speed and concentrator line speed, as shown in Table 5-7.

Communications Link	Transmission Line Capabilities		
	Minimum	Recommended	Future
Terminals/Concentrators	2400 HDX	4800 HDX	9600 HDX
Remote Concentrators/Host CPU	4800 HDX	9600 HDX	50K BPS

Table 5-7. Simplified TP Network Performance Parameters

The results of the simplistic line concentrator optimization analysis are presented in Table 5-8, and show that different approaches are required to evaluate each level of network configuration. The Minimum configuration displays the expected characteristics of reduced incremental savings in line costs per additional concentrator. The Recommended configuration points out that simple step-wise analysis may provide incomplete information, in that 1 or 2 remote concentrators may be deployed at constant total units. The Future configuration indicates that decentralization of line concentrators is not necessarily cost-effective solely for a reduction in line costs. Line concentrators also relievethe host CPU by performing functions necessary for operation of the TP communications network, as well as provide back-up facilities for primary communications control units or for an alternate CPU.

Configuration	Network Requirements		
	Minimum	Recommended	Future
No Remote Concentrators			
Total Concentrators	2	3	2
Line Cost Saving ($/Month)	0	0	0
1 Remote Concentrator			
Total Concentrators	2	4	7
Concentrator Location	Boise	Reno	Reno
Line Cost Saving ($/Month)	15,300	12,500	-100
2 Remote Concentrators			
Total Concentrators	3	4	
Concentrator Locations	Reno;Boise	Reno;Boise	
Line Cost Saving ($/Month)	18,900	18,700	
Incremental Saving from Second Concentrator ($/Month)	3,600		

Table 5-8. Concentrator Location Optimization

5.3.3.4 Conclusions

The range of estimated monthly charges for communications lines in the TP network as configured in section 5.3.3.2 is presented in Table 5-9. While the high values are those previously calculated, the low values represent a reduction of about 20 percent which could very likey attained through securing reduced tariffs. The charges are solely for use of communications lines and, where required, line conditioning and do not include costs of any connecting equipment that may be necessary.

Estimated Line Costs ($/Month)	TP Network Configuration		
	Minimal	Recommended	Future
High	39,500	47,600	129,500
Low	31,600	38,100	103,600

Table 5-9. Range of Estimated Cost of Communication Lines

While the proposed network configuration provides great reliability, flexibility of operation, and potential for growth and expansion, there was not sufficient time available to perform the extensive analysis and optimization that a network of this complexity sould receive. The steps that would be required to complete the analysis work that was initiated during the study are:

a. Firm the terminal-to-concentrator transmission requirements

b. Establish concentrator-to-CPU transmission requirements as a function of the number of terminals being serviced and their operating characteristics.

c. Obtain intra- and inter-state tariffs for comminications services in Alaska and from Alaska to IBPs (International Boundary Points) in the continental U. S.

d. Obtain pertinent information on reducted tariffs such as HILO, DDS, satellite communications links, and government furnished facilities available through the GSA.

e. Optimize both line and concentrators costs to provide all required capabilities at minimum cost.

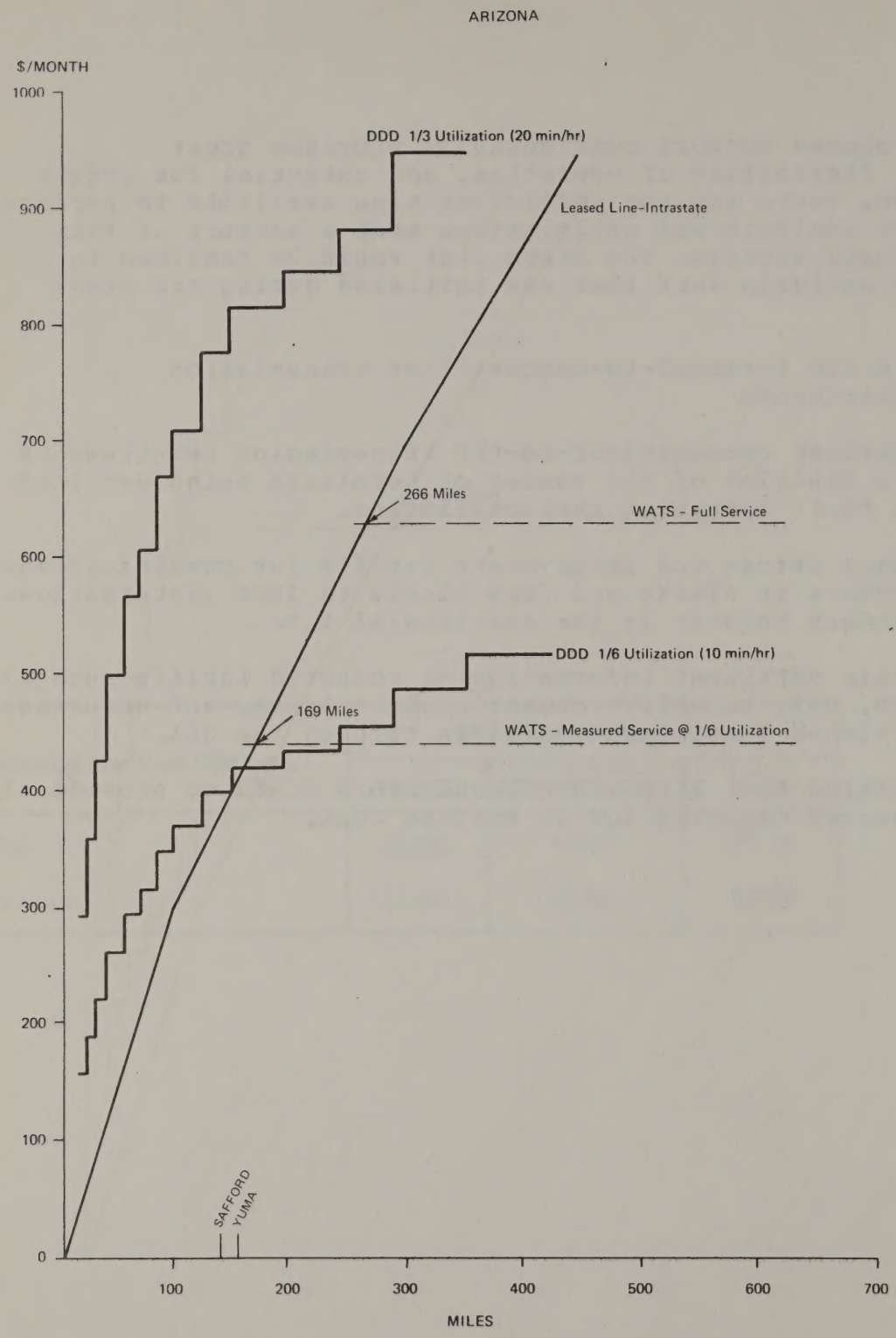

Figure 5-1. Arizona Cost Comparison

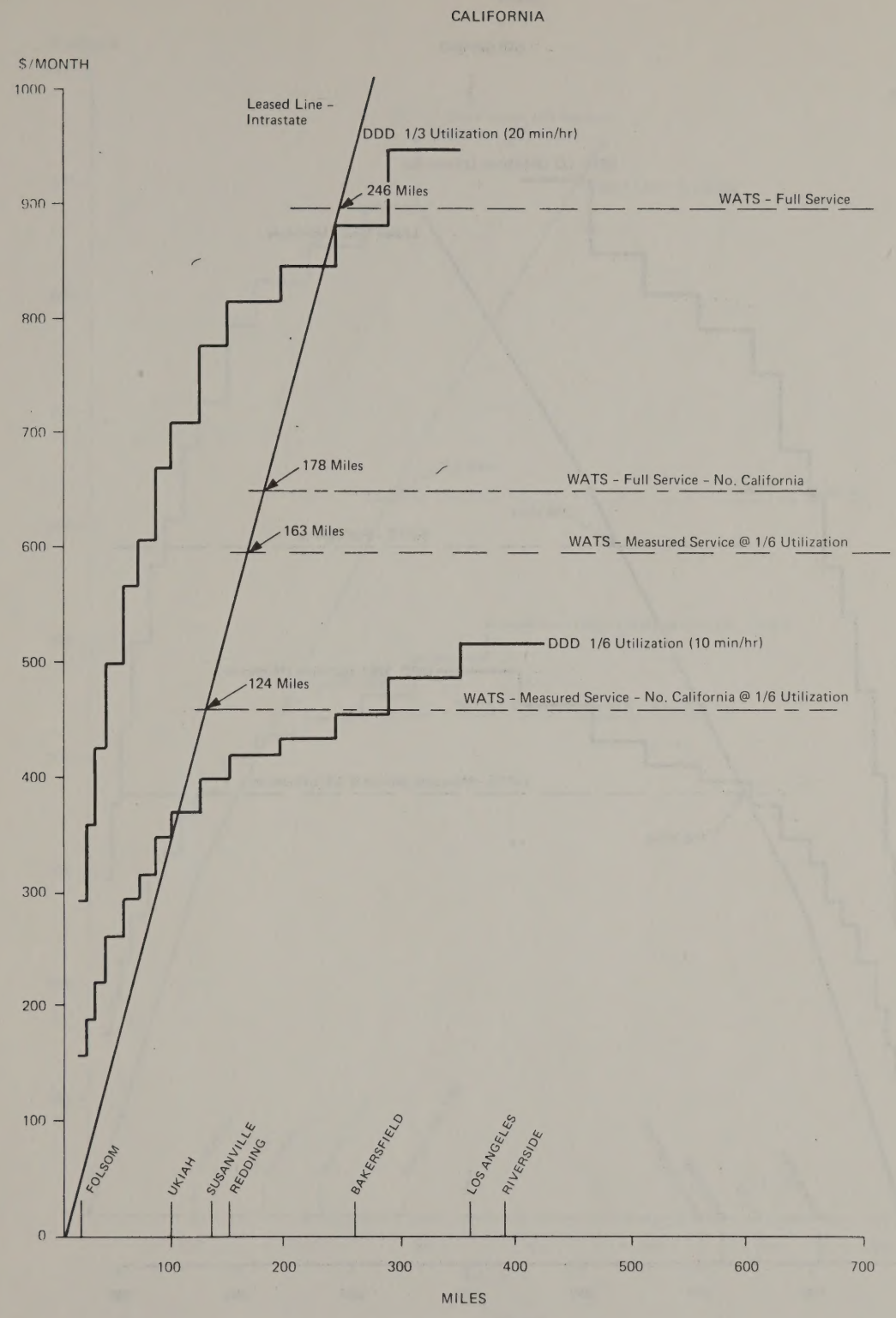

Figure 5-2. California Cost Comparison

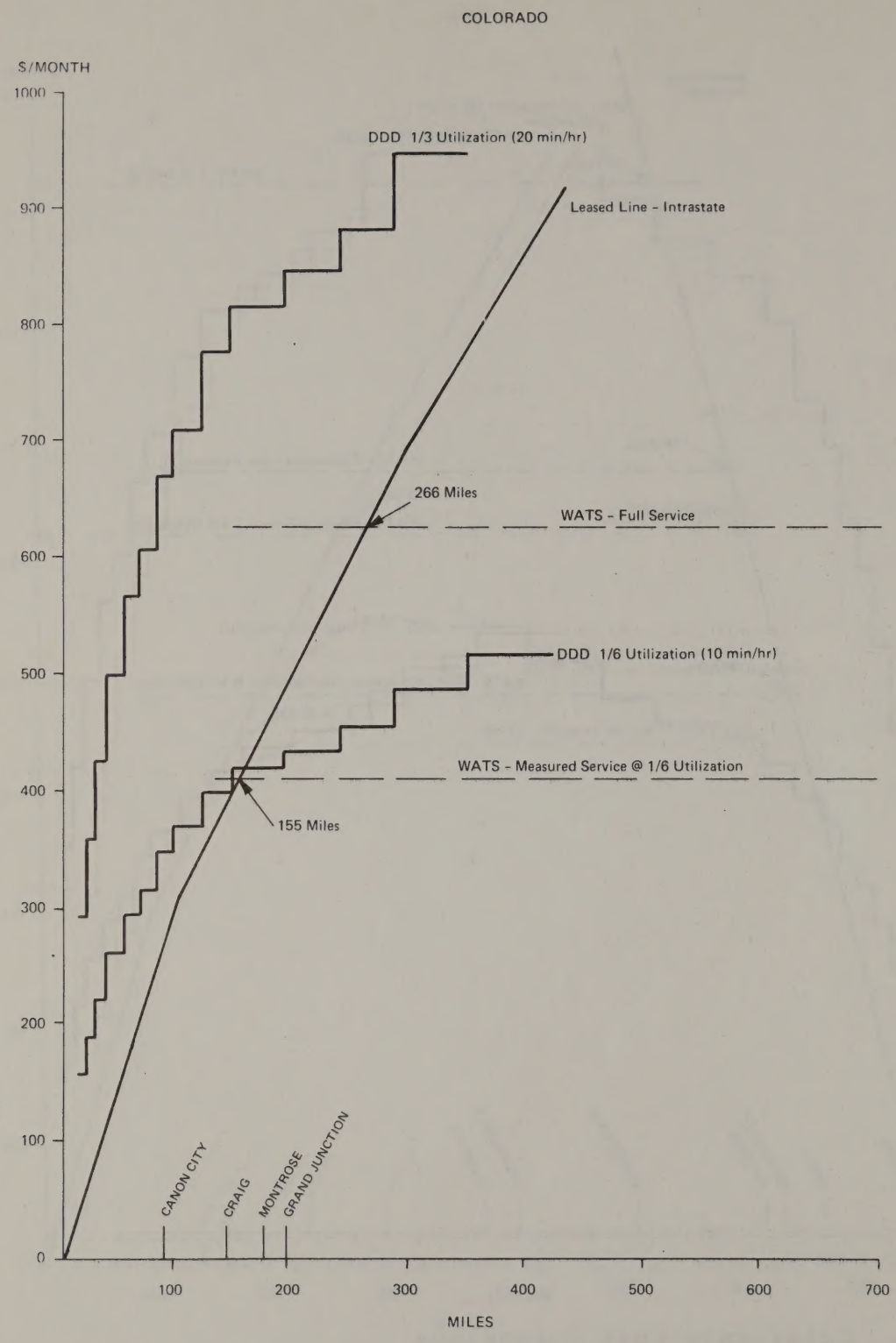

Figure 5-3. Colorado Cost Comparison

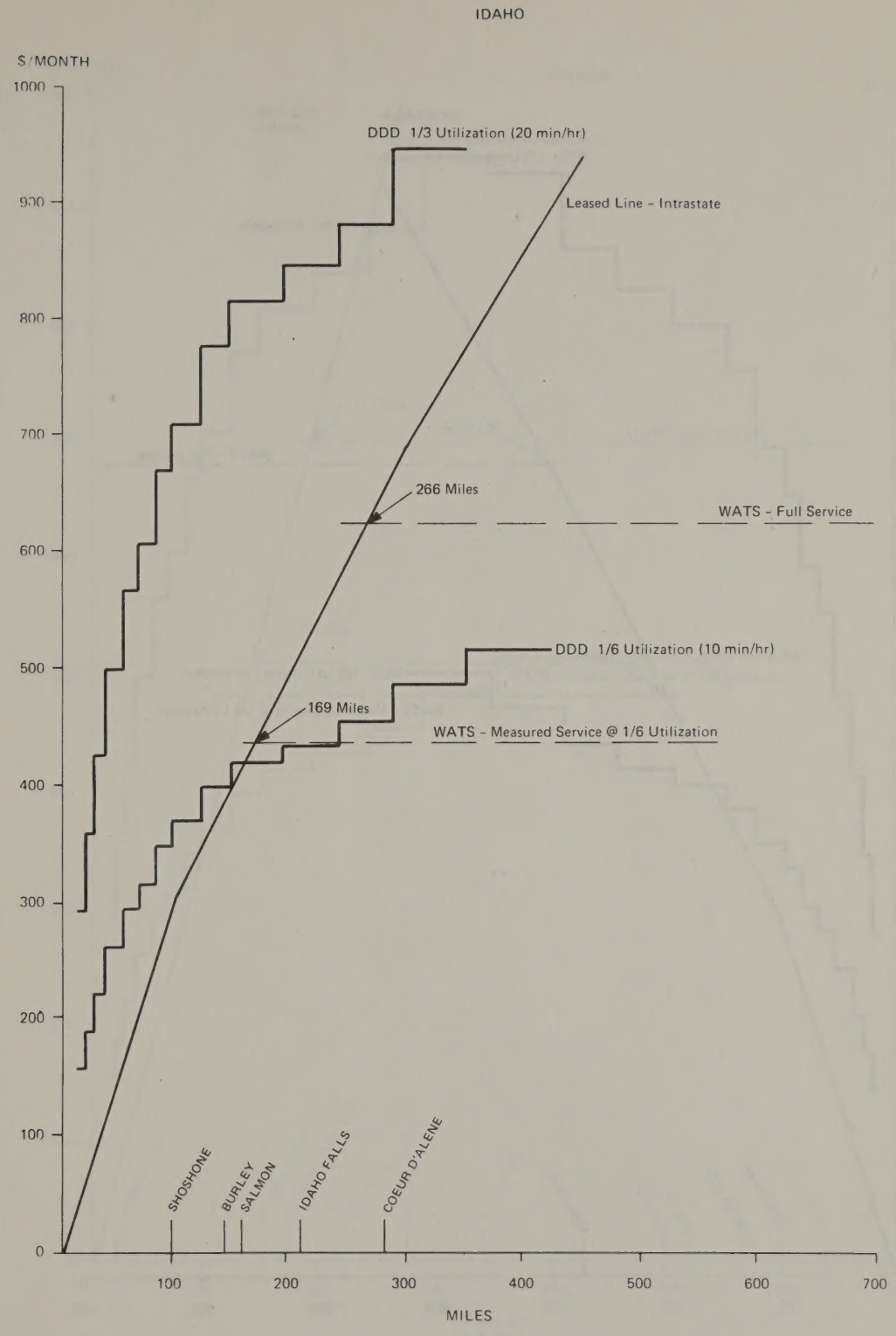

Figure 5-4. Idaho Cost Comparison

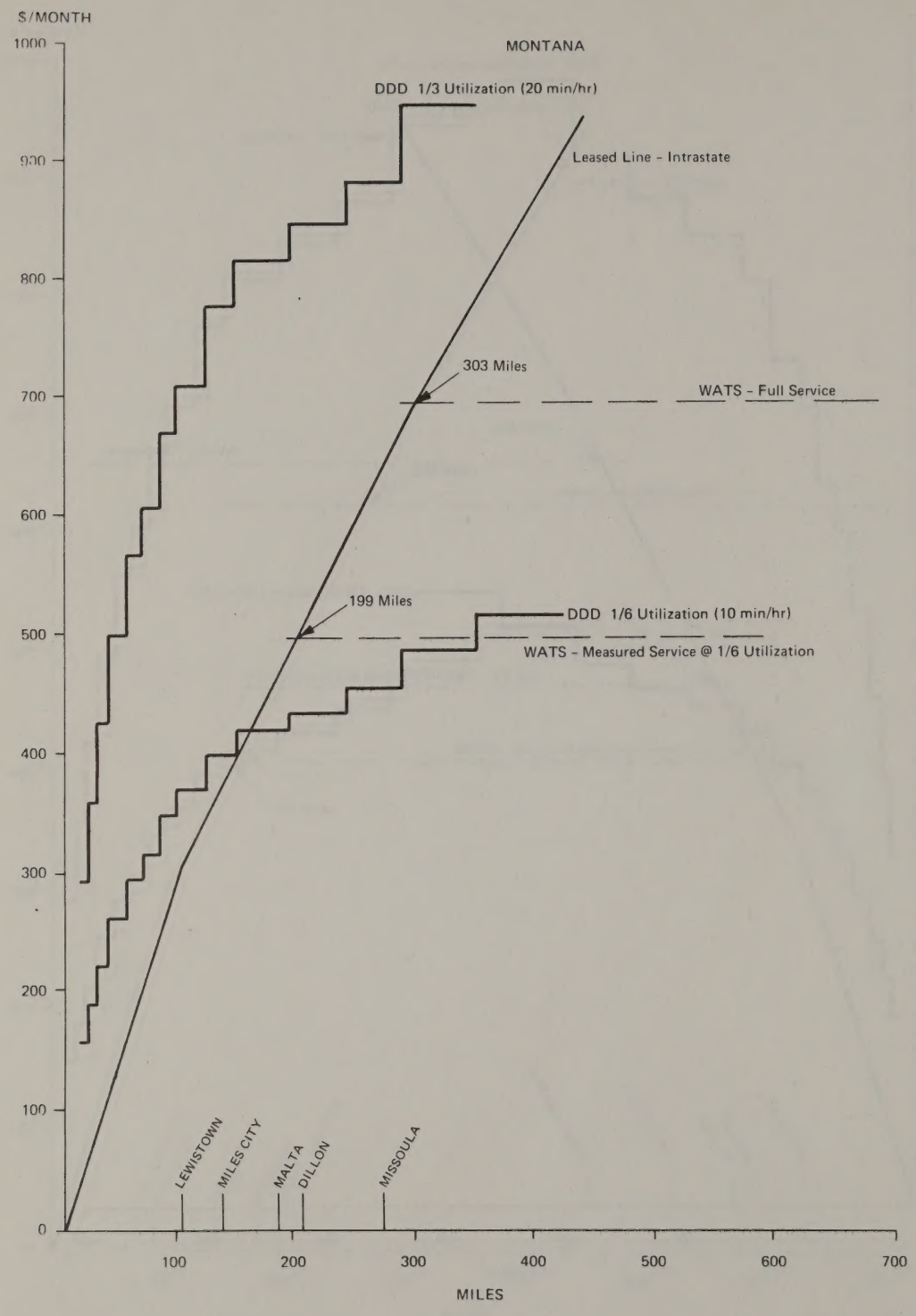

Figure 5-5. Montana Cost Comparison

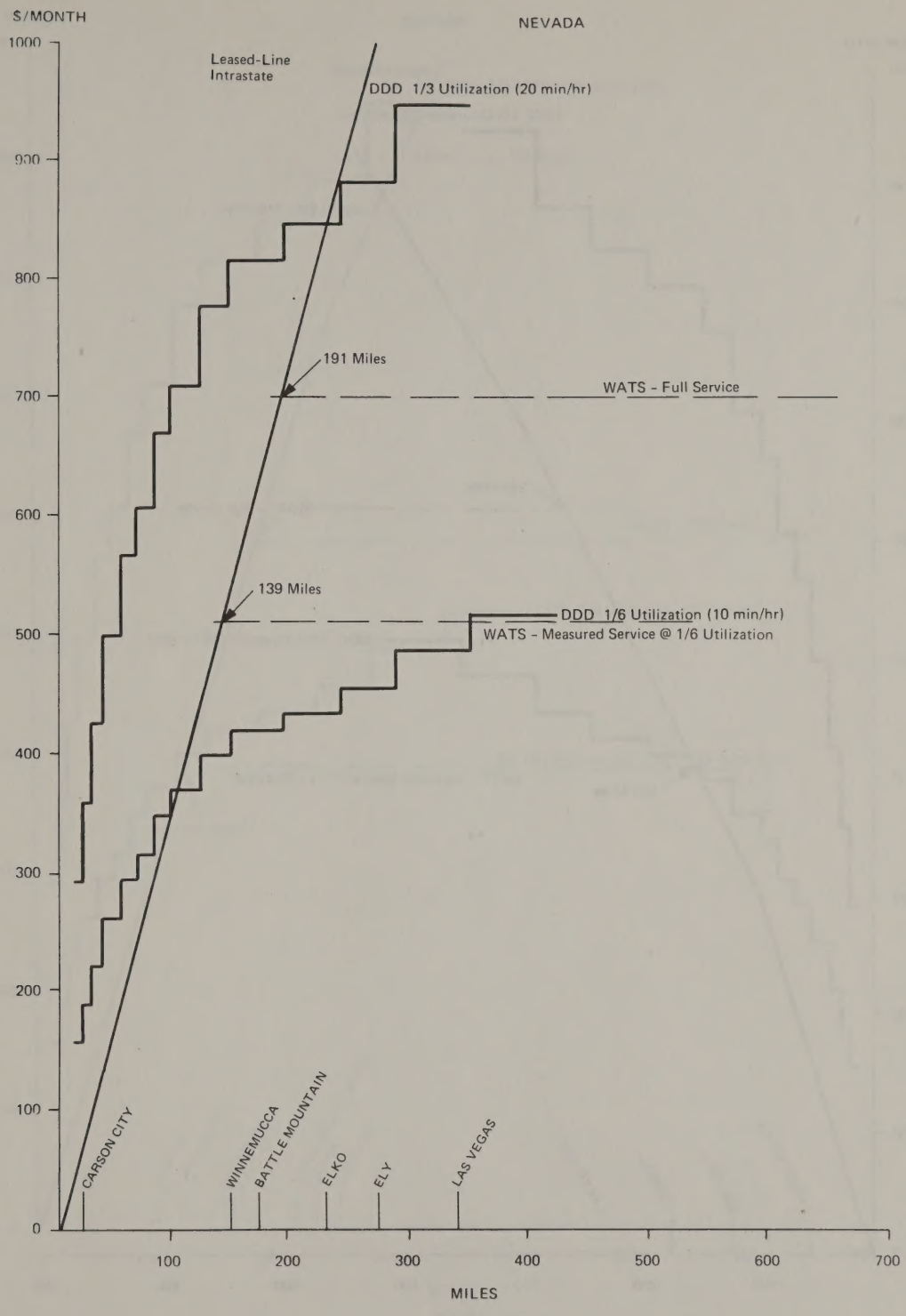

Figure 5-6. Nevada Cost Comparison

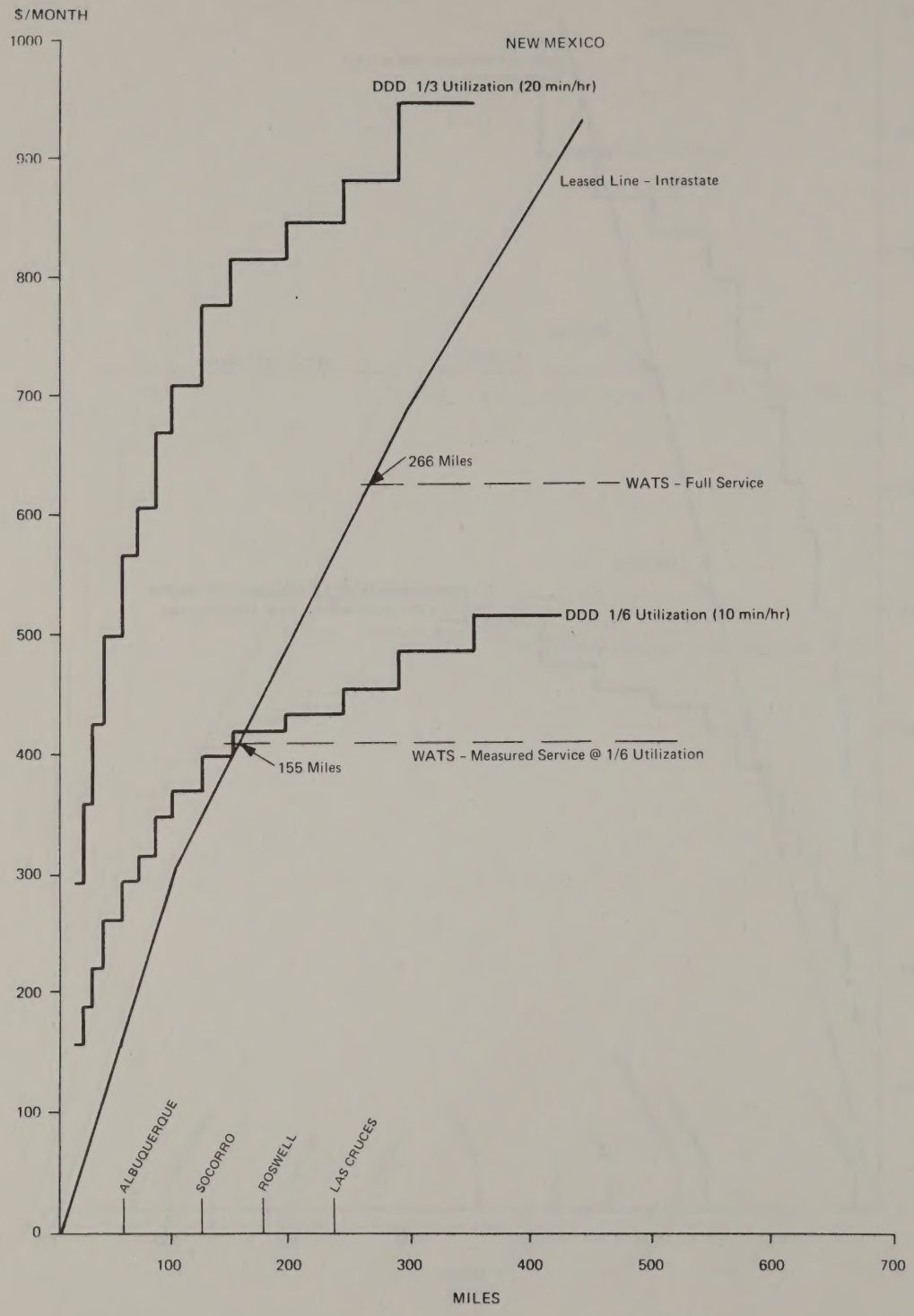

Figure 5-7. New Mexico Cost Comparison

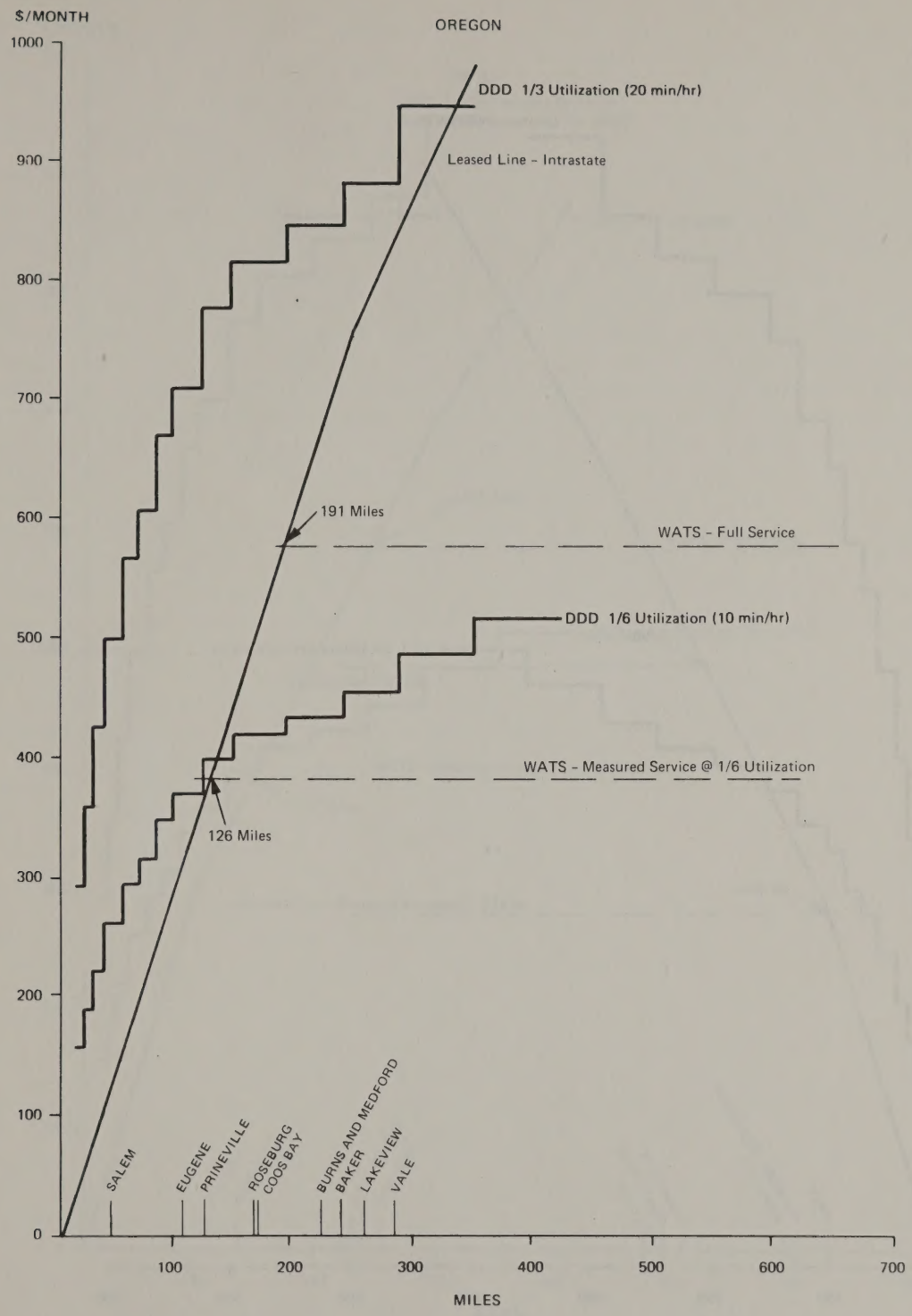

Figure 5-8. Oregon Cost Comparison

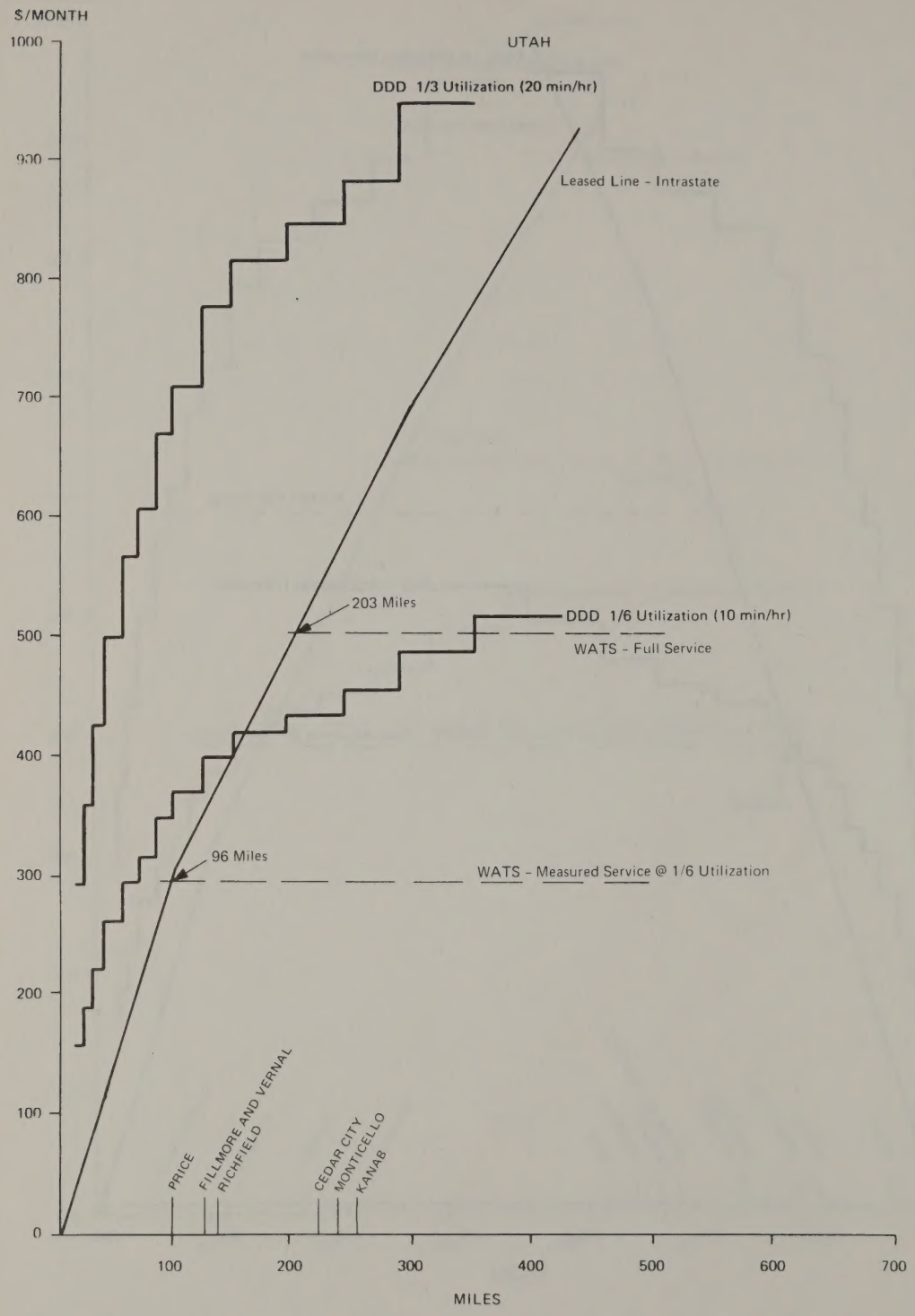

Figure 5-9. Utah Cost Comparison

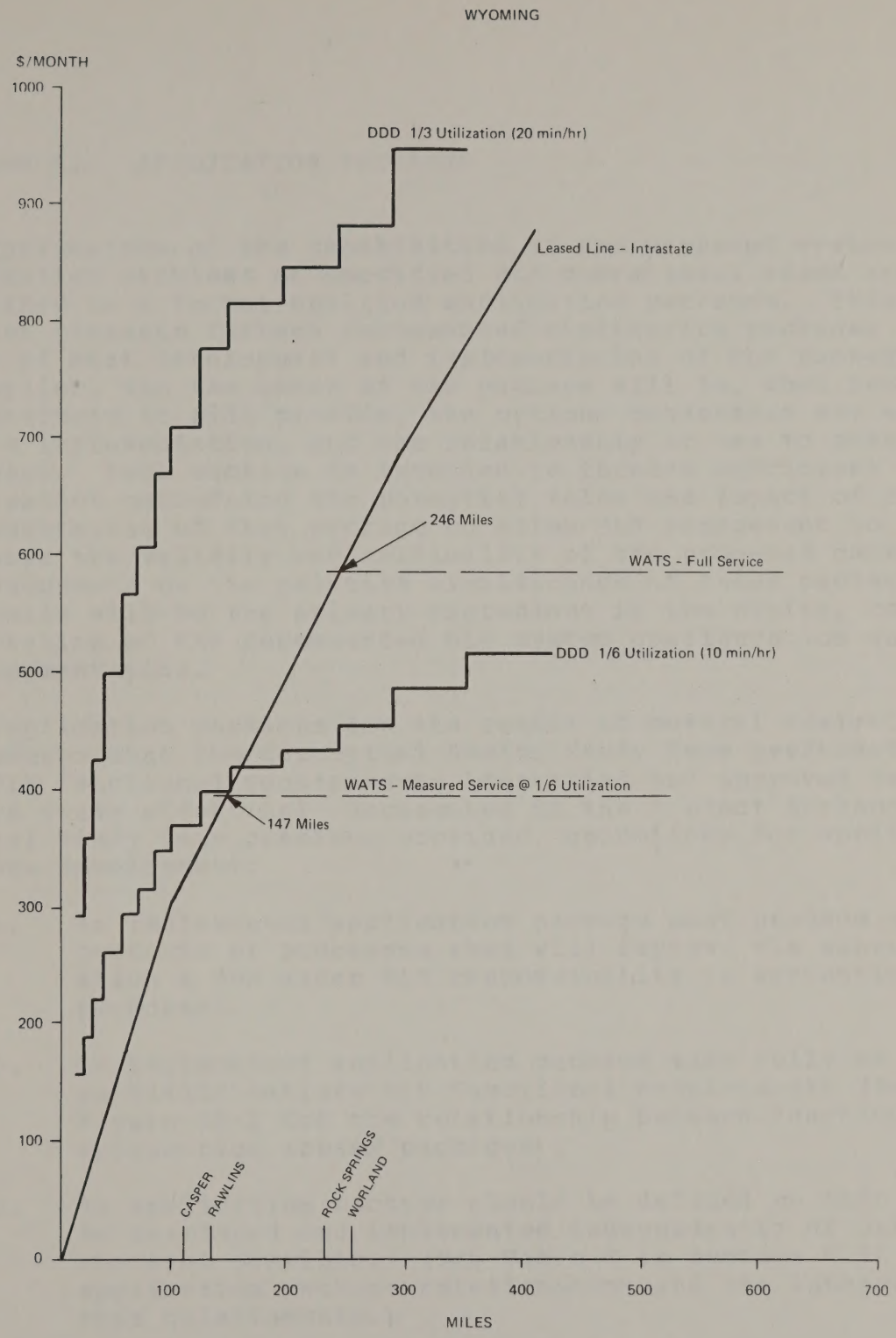

Figure 5-10. Wyoming Cost Comparison

Section 6. APPLICATION PACKAGES

The application of the capabilities of the proposed system to the information problems of specified BLM operational areas are described in a format entitled application packages. This section presents fifteen recommended application packages in terms of what development and implementation of the package will accomplish, who the users of the package will be, what benefits and products it will provide, the options management may exercise in its implementation, and the relationship it has to other packages. Each package is intended to furnish sufficient information concerning the potential value and impact of the implementation of that package to allow BLM management to evaluate the validity and criticality of the proposed package. The judgments on the relative significance of these package proposals will be the primary ingredient in the sizing, costing and phasing of the recommended BLM system configuration and development plan.

The application packages are the result of several analytical procedures that the Conceptual Design Study Team performed using the BLM functional requirements identified and approved earlier in the study effort and documented in the Project Workbook. Several Study Team premises provided guidelines for application package development:

a. An implemented application package must produce useful products or processes that will improve the manner in which a job under BLM responsibility is currently being performed.

b. An implemented application package must fully or partially satisfy BLM functional requirements (See Figure IV-1 for the relationship between functions and application areas/ packages).

c. An application package should be defined so that it can be developed and implemented independently of others wherever possible. (See Table 1 in section 6.16 for the application package relationships and the intensity of that relationship.)

Three Steering Committee premises provided further scope-of-study direction to the development of application packages:

a. An application package implementation should require limited or no organizational restructure

b. An application package implementation should require limited policy change requirements

c. Application packages must be consistent with long-range Bureau priorities.

Finally, natural, hierarchical functional relationships provided a criterion for application package development, i.e., to produce an effective, usable wildlife URA, a wildlife habitat inventory is a prerequisite. These functional hierarchical relationships exist independently of ADP support or manual support.

The first requirement for developing application packages within the Study Team and Steering Committee primises was to analyze the BLM functions in terms of ADP requirements. These requirements define the ADP framework for each application package and will form the basis for sizing, costing and phasing of the recommended hardware and software system configuration once package approval has been given.

The ADP requirements are:

a. Supplier: Who is responsible for supplying the data inputs to do a job, i.e., lease application legitimacy data is supplied by State Office Staff personnel.

b. Data: What kinds of data inputs are necessary to do a job, i.e., a lease application requires land status data, geologic and mineral resource data, environmental report reference sources. (23 discrete kinds of data have been identified. Each of these is a proposed data file. Attributes to such a file provide cirtical sizing and costing information of a system configuration. See Appendix B for a narrative definition of each proposed file.)

c. Output products: What output product(s) result from performing this job, i.e., an up-to-date case file on a lease or an environmental report.

d. Users: Who uses the output products, i.e., USGS, the State Office and the District Office use the up-to-date case file for compliance checks.

e. Volume: How many transactions are executed each time a job is executed including the lowest and highest estimates.

f. Frequency: How often is the job done in a given period of time.

g. Response time: What is the average, minimum and maximum response times that can be tolerated between initiation of a job and its completion.

These requirements are defined and documented for each application area; the definitions provide the framework within which each application area is packaged and documented. The resultant package documentation is the vehicle to convey the justification for developing automated capabilities in terms of BLM operational and administrative responsibilities.

Having determined ADP requirements for each application area, the next step was to define automation and remote sensing capabilities that are potentially available to fulfill the ADP requirements and more effectively satisfy BLM functional needs than is currently possible. (These capabilities are described in detail in Appendix A.) For example, a main criterion for determining interactive, online job execution as opposed to batch job execution to support a particular BLM job is the geographic relationship to supplier, user and response time. Identification of the job's output product format - map, statistical table or narrative report - is necessary to determine the need for mapping output capability or structured data output capability or text composition capability.

By combining Study Team and Steering Committee assumptions, BLM functions and their natural relationship, common automation requirements (commonality of data, output products, users, suppliers, volumes, frequencies and response times), sections of BLM operations were grouped as application areas.

It is an important fact that within an application area, less ambitious and powerful packages may be selected for implementation, by developing a limited set of automation capabilities. This can be illustrated by a decision to develop and install the preparation support proposed in the EAR/EIS Preparation and Publication Application, but to postpone or reject implementing the publication support. Also, management flexibility and control is provided in that when an automated capability has been developed, in most cases, adding new input data types (program emphasis) or new offices (geographic emphasis) to the system can be decided according to resource availability and the need. Therefore, a decision to automate a coal leasing package in the Wyoming State and District Offices may be made separately or concurrently with a judgment to implement a grazing permit package in the State of Nevada.

Each application package description which follows will contain documentation written to provide sufficient information concerning potential value and impact of package implementation to allow for a meaningful evaluation of the validity and need for implementing the proposed package.

Guidelines for review of each section of application package documentation are:

a. The introduction describes the objective of the package, the BLM tasks (jobs) within the application area to be supported, the current operational problems to be alleviated and the automation capabilities to be utilized. Current operational problems in performing the stated BLM tasks are documented to establish the validity of considering automated support. Automated capabilities required to support the tasks and alleviate the problems are documented in detail:

    1. To provide the base for the hardware/software configuration considerations

2. To provide the basis for predicting the impact of application package development options open to BLM by establishing the interaction between tasks, operational problems involved in doing those tasks, and the various ADP capabilities which will alleviate the problems.

b. Anticipated benefits describes in detail the potential measurable benefits to be derived from implementation of the application package. Changes in BLM current operations and duties caused by the introduction of automation will be explained. The envisioned users of the package and a list of products available from the package are included.

Benefits in terms of improved output products, additional users, better manmonth utilization, easier access to information, etc., are documented for each BLM task associated with the application area to allow the Steering Committee to evaluate the criticality in terms of benefits derived from inplementing the proposed package in terms of long-range Bureau priorities.

c. Requirements describe what must be satisfied to implement the application package:

a. Data set requirements

b. Supplies responsibility requirements

c. Intensity of input requirements from other application areas.

As in the Benefits area, the requirements information is documented for each BLM task associated with the application area to allow evaluation of the criticality in terms of mandatory and optional prerequisites for implementing the proposed package.

d. Application Package Relationships presents in pictorial form the relationship of the particular application package to other application areas. Whether the relationships involves receiving data or providing data is identified.

A reference is supplied to detailed descriptions of each application relationship in Section 6.16. There are two purposes in documenting these relationships. These are that they provide:

1. Another viewpoint in considering the potential value and impact of the implementation of an application package

2. A basis for deciding package implementation priorities when considered in terms of long-range goals.

e. Implementation Options describes the phasing options that are possible within an application package. These options are presented to conceptually validate that the BLM workload (tasks) associated with the application package can be implemented in a phased pattern according to program and geographic priorities.

The application packages that have been identified and are described herein are the following:

6.1 Resource Inventory

6.2 Planning-Unit Resource Analysis (URA)

6.3 Planning-Management Framework Plan (MFP)

6.4 Program Planning

6.5 Annual Work Planning and Program Management

6.6 Financial Management-Accounting and Fund Control

6.7 Financial Management-Payroll

6.8 Land Records Management

6.9 Case Management

6.10 Utilization Management

6.11 Manpower and Organization Management

6.12 Property Control and Management

6.13 Protection

6.14 Regional Analysis

6.15 Environmental Analysis Report/Environmental Impact Statement (EAR/EIS) Preparation and Publications.

6.1 RESOURCE INVENTORY

6.1.1 Introduction

6.1.1.1 Objective

The objective, in this application area, is to provide automated support in the resource inventory area. This will give BLM the following:

a. Centralized storage of data

b. Rapid access to the appropriate stored resource data

c. Ease in correcting resource data

d. Assistance in planning more effective data collecting expeditions

e. Consistency of format and information detail among disciplines

f. Access to pertinent technical documents

g. Better techniques to analyze the resource data

h. Faster and more accurate data gathering when automation is coupled with remote sensing.

6.1.1.2 Tasks

The Resource Inventory tasks that will benefit from implementation of this package are:

a. Field preparation

b. Field Collection

c. Interpretation and Analysis.

6.1.1.3 Current Situation

6.1.1.3.1 Description

The following descriptive subtasks present a picture of how the Resource Inventory tasks are performed. A resource specialist is not required to do each individual task or subtask but only those that are associated with a particular resource inventory procedure.

a. In the Field Preparation area, the resource specialist does some or all of the following:

1. Selects the site to be inventoried.

2. Assembles maps, technical literature, and previous survey results of the selected area.

This is a major problem area because the data can be located in many places and be inaccessible or out-of-date.

3. Prepares type maps of the area. This is a very time consuming job.

4. Determines the acreage, survey method, number of plots, number of transects, etc. Most of this information is straight forward but determination can be very time consuming.

5. Establishes a work plan including:

(a) Type map

(b) Equipment needed list

(c) Travel course to site

(d) Field collector training.

b. In the Field Collection area, the resource specialist does some or all of the following:

1. Verifies the plot location and boundary by comparing against the type map

2. Collects resource data and samples

3. Records the information on a field collection form or notebook

4. Takes photos or makes diagrams.

Automation will not be able to elminate the burden of field work but remote sensing technology coupled withautomation has a large potential to assist in the collection of resource information. See report Phase III for paper on remote sensing.

c. In the Interpretation and Analysis area, the resource specialist does some or all of the following:

1. Edits the data and completes the survey record.

2. Store and/or update the data.

3. Uses the field collected data to perform many calculations for various uses, such as:

(a) Yield capability

(b) Volume

(c) Peak discharge.

4. The data is also used to determine:

(a) Site index

(b) Form class

(c) Rating point

(d) Rank watershed

(e) Rate the area

(f) Condition

(g) Class.

5. Develop a type map

6. Develop a progress report.

6.1.1.3.2 Problem Areas

Automation will help the resource specialists in the following problem areas, if the data has been converted to a form required for ADP:

a. The Field Preparation and Interpretation and Analysis tasks require overlay products. More than 50 overlays per planning unit are required depending on the resource category and complexity of the area. The data which supports these overlays has:

   1. Varying degrees of turbulence (i.e., geologic data is static while land use data is dynamic)

   2. Varying degrees of spatial detail and information content

   Current methods of preparing and maintaining up-to-date resource overlays are too slow and become out-of-date before they are completed.

b. Mylar overlays present problems of maintenance and eventual replacement. Regardless of how carefully they are handled, deterioration cannot be avoided. Tearing, peeling and smearing effects are usual. Increased usage of these overlays increases the utility and benefits to BLM but tends to decrease their lifespan.

c. Only a single copy of each mylar overlay is prepared. This causes a problem of availability if several resource speciaaists in an office need the overlay simultaneously. Unless the office has instituted a sign-out system or has duplicate copies the resource specialist may have difficulty in locating it.

d. Statistical tables used in various BLM documents and programs have the following problems:

   1. The data has to be located and extracted from many source documents that are physically removed from the resource specialists' office

2. Manual calculations are subject to arithmetic errors

3. Clerical support can result in errors in transposing, placement, etc.

e. Specific resource data should be gathered only once in any particular area but because physical storage requirements are limited, retention of valuable data becomes infeasible. While it is estimated that only a small portion (based on site survey information) of the land and inherent resources that BLM manages has been adequately inventoried, even this figure is misleading because of the need to repeat certain inventories.

f. Needed resource data can often be buried in voluminous reports requiring many hours of extensive searching through large amounts of extraneous information. The resource specialist has neither a voice in the format of the reports nor their frequency or content.

g. If the resource specialist needs access to existing automated data, the specialist must request a specific report via mail or telephone from the DSC processing staff. A time lag of at least a week or longer if the software or program is not available can be expected because the computer program must be schedulld or written if the request is for a non-existent report. When the report is produced it must be mailed to the requesting office.

h. When a resource specialist is planning a field trip or analyzing the Data gathered on a field trip, it often becomes necessary to refer to technical reports, previous BLM decisions, legal information, etc., to perform the work correctly and accurately. This information is not always readily available or the speciaist maybe unaware of its existence.

i. Resource potential modeling, trending, mineral extraction/usage simulation, etc., are laborious, manual procedures that require excessive amounts of time and are prone to miscalculations.

6.1.1.3.3 Supporting Charts

Chart 1 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.1.1.3.1 to the problems identified in Section 6.1.1.3.2. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which problem areas

b. To show how widespread a problem is by presenting the number of application area tasks affected by that problem

c. Assuming that the more widespread a problem the higher priority for solution, it can be used as the basis for determining a schedule for implementing solutions.

PROBLEMS / TASKS	a. Overlay preparation methodology	b. Overlay deterioration	c. Overlay availability	d. Statistical table preparation	e. Physical storage limitations	f. Report format and volume	g. Report production methodology	h. Availability of Technical Info.	i. Special processing methodology			
a. Field Preparation	X	X	X	X	X	X	X	X				
b. Field Collection												
c. Interpretation & Analysis	X	X	X	X	X	X	X	X	X			

Chart 1. Problems vs Tasks

Chart 2 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.1.1.3.1 to the current BLM ADP support systems. The matrix is intended to show which application area tasks are currently supported in any degree by automation.

TASKS / CURRENT ADP SUPPORT SYSTEMS	a. Field Preparation	b. Field Collection	c. Interpretation & Analysis									
P.D. Inventory	X		X									
CRIS			X									
ORIS (Map/model)			X									
Watershed control & development			X									

Chart 2. Problems vs Current ADP Support

6.1.1.4 Required ADP Capabilities

6.1.1.4.1 Description

Full automation of this application area will require use of certain ADP capabilities. Those capabilities are described below.

BLM presently has a small fraction of their lands and inherent resources inventoried. That is, descriptive attribute data and type maps are available for reference and study. A great portion of BLM work revolves around the resources and land it is charged with managing. Most of the people in BLM are directly involved with the various resources. It is, therefore, very apparent that the major goal within BLM is to get the most complete, accurate and extensive information coverage of the lands and resources under its care.

The capability to process type map and resource attribute data must be developed to provide BLM with this most effective and powerful tool in attempting to achieve this goal. Even if the number of lands and resources inventoried doesn't increase significantly over the next year, automated storage of that data can lessen the number of repeat trips for the same information, aid tremendously in the planning phase by providing ready access to identify what remains to be inventoried and can be of enormous assistance in case flow by giving the state staff a quick look at the current situation regarding lands and resources.

To realize the benefits of automating the lands and resources inventories, the map update, retrieval and display capabilities and the fixed format (attribute) data update, retrieval and display capabilities must be developed first. While it is true that each is a stand alone capability and could be developed sequentially, they so complement each other in supporting the storage, processing and utilization requirements of BLM for resource information that development of these capabilities together must be recommended.

The map and fixed format (attribute) capabilities provide the ability to display ressurce data in various arrays that must be described each time a report is to be produced. While this is an acceptable procedure for infrequent, ad hoc reports, it becomes inefficient and cumbersome for frequently recurring

reports or reports that contain a lot of information. It is, therefore, recommended that the report generator capability be developed as a second priority. The report generator will give the user the capability of defining a report once using a set of parameters and continuing to receive the report in that format until a change is desired. This is not to say that the report's format is now inflexible. With minor adjustments to the input parameters the report format can be altered as the need for new or different data becomes apparent.

The BLM has many ways to use the resource and land data but one of the most beneficial is to be able to project potential use or determine historical and present depletion rates and, therefore, predict future depletion if the rate is continued, accelerated, and decreased. This type of forecasting can be significantly augmented, both in timeliness and accuracy, through the use of special processing, i.e., mathematical models. This capability can then be used in conjunction with the report generator to present resource decision alternatives based on various parameters or the ad hoc retrieval/output to present simple statistical arrays, e.g., three-dimensional matrices, calculations, or tables.

Textual processing retrieval, including library abstracts and output, is used to obtain technical resource information for planning a field trip or analyzing the data collected.

This will give the resource specialist access to heretofore unavailable sources of information such as research studies, technical document abstracts, etc. The specialist can keep abreast of changes in any discipline by quickly scanning for an area of interest using keywords and then a perusal of the abstract will indicate if the reference material identified may be useful.

Job execution-interactive would be used to put type map and resource attribute data into the appropriate data base after it has been collected as well as extract and display it for analysis. Batch would be used to extract and display type map using a plotter and attribute data using a printer.

Data base conversion would be used to convert existing ORIS, PD inventory, and CRIS data into the new data base.

Computer-assisted training could be used instruct temporary field collection personnel and as a refresher for permanents.

Image processing would be used in the planning and analysis phases to produce type maps with the aid of a computer.

6.1.1.4.2 Supporting Charts

Chart 3 is a matrix which presents the relationship of the application area tasks and subtasks described in detail in Section 6.1.1.3.1 to the required ADP capabilities identified, specifically, in Section 6.1.1.4.1 and, generally in Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required to support the application area tasks and subtasks

b. To show which ADP capabilities provide the most support throughout the application area

c. Assuming the more tasks associated with an ADP capability associated with the greater the need for its development, it can be used as a basis for determining a schedule for development.

Chart 3. ADP Capabilities vs Tasks

TASK/SUBTASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
		Retrieval/ Output																			
	Update	Pre-defined	Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Field Preparation																					
1. Selects the site to be inventoried					X														X		
2. Assemble the selected area's:																					
(a) Base maps					X															X	
(b) Technical literature							X												X	X	
(c) Previous survey results		X															X		X		
3. Prepare type map of area				X						*	*	*	*						X		*Computer assisted from photos
4. Determine the area's:																					
(a) Acreage									X										X		
(b) Survey method							X												X		
(c) Number of plots							X												X		
(d) Number of transects							X												X		
5. Establish a work plan to include:																					
(a) Type map					X														X		
(b) Equipment needed list		X																		X	
(c) Travel course to site									X										X		
(d) Field collector training															X				X		
b. Field Collection																					ADP will not be able to directly support this area
1. Verify the plot by comparing to type map:																					
(a) Location																					
(b) Boundary																					
2. Collect																					
(a) Resource data																					
(b) Samples																					
3. Record info in notebook																					
4. Take photos or make diagrams																					
c. Interpretation & Analysis																					
1. Edits the attribute data	X																				
2. Store/update field collected:																	X				
(a) Attribute data	X																		X		
(b) Type map data				X															X		
3. Perform calculations, using field data									X												
4. Develop type map					X					*	*	*	*						X		*Computer assisted from photos
5. Develop progress report		X			X															X	

Chart 4 is a matrix which presents the relationship of the required ADP capabilities described in detail in Section 6.1.1.4.1 and generally in Appendix A to the problems identified in Section 6.1.1.3.2. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are needed to help solve the problems in the application area

b. To show which ADP capabilities provide the most support, i.e., help solve the most problems

c. Assuming the more problems solved by an ADP capability the greater the need, it can be used as the basis for determining a schedule for development.

Chart 4. ADP Capabilities vs Problems

PROBLEMS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Overlay methodology in:																					
1. Preparation					X														X		
2. Alteration				X															X		
b. Overlay deterioration					X														X		
c. Overlay availability:																					
1. Use					X														X		
2. Update				X															X		
d. Statistical table:																					
1. Located and extracted		X	X																X		
2. Calculations										X									X		
3. Presenting		X																	X		
e. Physical storage limitations	X																		X		
f. Report format, volume, frequency		X																	X		
g. Report production methodology:																					
1. Attribute data		X																	X		
2. Type maps					X														X		
h. Technical information availability								X											X		
i. Special processing methodology										X									X		

6.1.2 Benefits

6.1.2.1 Introduction

The benefits of applying specified ADP capabilities to problems in the current BLM situation can be described in terms of:

a. Resource inventories producted more efficiently

b. Better use for collected resource data

c. Better management of the land and resources

d. Saving in time spent (man hours) collecting the data, analyzing it, and storing it

e. Land and resources inventories completion will expand rapidly beyond the current 10-20%

f. Storage space savings.

6.1.2.2 Detailed Benefits

a. Discipline oriented resource data is collected by resource specialists in all 60 districts and 4OCS offices. If data concerning another discipline is needed, it usually must also be collected. Because the information is in a notebook or file cabinet it may get misplaced or mutilated. If the attribute and type map information was placed in an automated system the resource specialist would have immediate access to the data for review and reference. The hundreds of resource type map overlays and resource attribute data reports required by the resource specialists could be produced for the area and at the scale desired. Specialists in other disciplines would have access to that data as well as any that may have been collected in their discipline. Space would be saved by eliminating the notebooks and file cabinets.

b. Currently, all 60 districts and 4 OCS offices use manual techniques to prepare inventory map overlays for Planning and Field Collection work. The mylar overlays are drawn at a particular scale and if a new scale is desired a new mylar must be produced. Each district has

a storage problem because of the number of type maps produced each year.

An automated system would allow for simultaneous digitizing while the type map is being produced. This means that corrections would be easier since the map data is centrally stored and readily accessible, the map scale canbe easily changed to fit the needs of the resource specialist and since each type map is stored by automation the many file cabinets needed to house the mylarscan be eliminated.

When using an automated approach, as the overlay is traced the information can be digitized and stored. Resource attribute data may be annotated to the appropriate area of the overlay. Immediate or subsequent corrections or alterations are possible by simply replacing or erasing the erroneous dataand adding the correct information. Any resource specialist can readily retrieve, review and obtain a paper or mylar copy of any stored overlay. The specialist can change the overlay scale and, if satisfied with the new overlay, obtain a copy of it. Because all overlays are retained, automated comparisons can be made over time periods to determine trends in resource status and utilization.

c. The resource specialist in the 60 districts and 4 OCS offices presently responds to resource collection requirements on a reactionary basis. If the previously collected resource information were stored and readily accessible, a proper collection plan could be formulated, based on the areas remaining to be done and associated priorities. Type maps could be produced for a selected site to allow for field trip planning. This storage of past resource inventory data and planning of resource collection efforts would eliminate much of the current duplication of resource data gathering effort, thus saving many man months. The small fraction of lands inventoried could grow at a faster rate. Also it enables audit to be made of the status of a resource inventory. This could be accomplished by a Statistical audit by the computer.

d. When a resource specialist in each district and OCS office needs specific detailed resource information for planning or analysis, the data must be sifted out of the total available. This may require many hours of extensive searching through many reports or files. Automated resource attribute data that had been previously stored could selectively be requested and displayed in a specified format thus eliminating the effort required to search through, extraneous information.

e. The hundreds of reports the resource specialist in each district and OCS office currently works with when planning field trips or analyzing the data have several faults. The formats are inconsistent and the timeliness is often not acceptable. Once a report (i.e., equipment checklist, quality evaluation charts and scoresheets, use estimate summary sheets, etc.)is requested it is received perpetually even if it later becomes unusable. Using an automated system the user would have control over the format, the level of detail and timeliness of the required reports.

f. An automated system would provide all BLM resource staff personnel with access to special processes for use in analyzing field collected data. This capability would improve the speed and accuracy of such things as cost benefit analysis, supply and demand analysis, etc., that are constantly being used by the resource specialist in each district and OCS office. It would also providing the capability to perform complex modeling, such as projecting resource requirements. which is currently not in full use.

g. Technical reports (i.e., bibliographies, abstracts, BLM findings, BLM technical supplements, etc.) are not always readily available to the resource specialist in each district when they needed for planning or analyses. The reports could be stored at another office and are not readily available to the resource specialist even if knowledge of their existence was common or they are overlooked because the subject is not highlighted.

Automation can be used to quickly and centrally store an abstract of the technical report and identify major

words or subject areas described in the report. The desired technical report titles and locations can then be rapidly retrieved by the highlighted identifiers for use in resource data collection planning, or in connection with data interpretation and analysis.

6.1.2.3 Supporting Charts

Chart 5 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.1.1.3.1 to the anticipated benefits identified in Section 6.1.2 and the output products. The matrix is intended to serve four purposes:

a. To provide a list of the generic products associated with a task.

b. To show the anticipated benefits associated with a particular task.

c. Assuming that the more anticipated benefits associated with a task the greater the gain to BLM, it can be used as the basis for determining a schedule for implementation

d. To show how widespread a benefit is by presenting the number of application area tasks affected by the benefit.

TASKS	PRODUCTS	BENEFITS										
		a. Centralized, easily accessible storage	b. Digitizing and storing of type maps	c. Systematic resource collection plan	d. Selective report content	e. Improved report production	f. Special processing capabilities	g. Technical abstract access				
a. Field Preparation	a. Type map overlays in each resource area.											
	b. A map of sites to be visited on a field trip											
	c. Reports containing information about various resources	X	X	X	X	X		X				
	d. Predefined resource data reports.											
	e. Various textual information											
b. Field Collection												
c. Interpretation and Analysis	a. Type map overlays in each resource area											
	b. Reports containing information about various resources											
	c. Predefined resource data reports	X	X		X	X	X	X				
	d. Various textual information											
	e. Various statistical and modeling reports											

Chart 5. Tasks vs Products and Benefits

Chart 6 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.1.1.3.1 to the potential BLM users of products generated when the task is automated. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which users

b. To show how many users will receive products from automation of the particular task

c. Assuming that the more anticipated users, the higher the priority for implementation, it can be used as a basis for determining an implementation schedule.

USERS / TASKS	District Staff: Resource Specialist	Resource Area	Special Office Staff: OCS	State Office	BIFC/DSC	Special Task Forces						
a. Field preparation	X	X				X						
b. Field Collection	X	X	X			X						
c. Interpretation & Analysis	X	X	X	X	X							

Chart 6. Tasks vs Users

Chart 7 is a matrix which presents the relationship of the anticipated benefits described in detail in Section 6.1.2 to the required ADP capabilities identified specifically in Section 6.1.1.4.1 and generally in Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required by this application area to realize the anticipated benefits

b. To show which ADP capabilities provide the most support in terms of the number of benefits associated with a particular ADP capability

c. Assuming the more anticipated benefits associated with an ADP capability the greater the need for the capability, it can be used as the basis for determining a development schedule.

Chart 7. Benefits vs ADP Capabilities

BENEFITS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Attribute and map data:																					
1. Centrally stored	X			X															X		
2. Easy access		X	X		X														X		
b. Type map:																					
1. Digitizing and storing				X															X		
2. Display for corrections					X														X		
3. Easy scale changing					X														X		
4. Hard copy					X														X		
c. Systematic resource collection plan:																					
1. Type map					X														X		
2. Attribute data		X	X																X		
d. Selective report content		X																			
e. Improve report production		X																	X		
f. Special processing capabilities									X										X		
g. Technical reports:																					
1. Access							X												X	X	
2. Storage						X													X	X	

6.1.3 Requirements

6.1.3.1 Introduction

To realize the benefits outlined in the previous section, the application package will need the support described in the following charts.

6.1.3.2 Supporting Charts

Chart 8 is a matrix which presents the data sets described in detail in Table 5-1 and in general in Appendix B that will be used by the application area tasks described in detail in Section 6.1.1.3.1. The matrix is intended to serve four purposes:

a. To show which data sets are required to execute application area tasks

b. To show how much use is made of a data set by representing the number of tasks within an application area that use the data set.

c. To show how the particular task uses the data in the data set, i.e., just displays the data, (R) adds new data (W) or corrects existing data. (R/W)

The symbols used at the intersections have the following meanings:

R - Indicates that the data in the data set is read, i.e., displayed on a video screen, in a report, etc., but no updating of the data takes place. This is just a visual display of the data for review, auditing, information, etc. For example, the resource specialist would want to examine previous resource surveys in a paticular area before making a field trip. To do this the various resource data sets are interrogated to determine if a resource survey was performed in the desired area and if so, what information was gathered in each resource category. This could be done initially using a video device and if the information is useful a hard copy could be obtained.

W - Indicates that the data set or a logical record is initially created without immediate review. An audit trail or error listing may be produced as a result of this update but no use is made of the updated data set. For example, a large amount of information may be added to a data set which would involve a time consuming effort to enter, edit and correct each transaction.

P/W - Indicates the data set is:

1. Created or updated and then used to produce a product. That is, the resource specialist enters the field collected data into the data set, makes corrections, if necessary, and the new data is displayed in a report.

2. Read and after some analysis data in the set is updated. For example, the resource specialist, prior to a field trip, could be perusing resource information from a resource area and, because of that specialist's knowledge of the area, fill in missing information.

R/* - Indicates that while reading the data in a data set a conflict with information in a second data set is discovered. No corrective action is taken at this time. For example, if the resource specialist was examining URAs in the secialists discipline and a discrepancy was noted with the previously examined resource inventory data, a field trip would be required before the discrepancy could be corrected.

It should be noted that the symbol used represents the most common usage of a data set by a task. This does not mean however that another function cannot be performed. The common procedure may be to read (R) only, but on occasion a write (W) or conflict reduction (R/*) may be done.

Detailed menus for each data set are found in Phase IV of the report.

Chart 8. Tasks vs Data Sets

TASKS	DATA SETS																					
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	Program Plans	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
a. Field preparation	R	R	R	R	R	R	R	R	R	R								R	R	R		
b. Field collection																						
c. Interpretation and analysis	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W													

Chart 9 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.1.1.3.1 to data maintained in other application areas and BLM personnel responsible for supplying application input data. The matrix is intended to serve three purposes:

a. To show which other application areas furnish information to the application area task

b. To show the personnel position titles within BLM which are responsible for providing information to the application area task

c. It may indicate critical application area linkages, which would affect the implementation sequence.

Chart 9. Tasks vs Application Area Inputs and Supplier Responsibility

TASKS	APPLICATION AREA INPUTS															SUPPLIERS								
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	EAR/EIS	Regional Analysis	Protection	District Resource Specialist	Resource Area Manager							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15									
a. Field preparation	X							X								X	X							
b. Field Collection	X															X								
c. Interpretation & Analysis	X															X								

6.1.4 Application Package Relationships

6.1.4.1 Introduction

While a package is designed to be implemented without automated dependence on other packages, a relationship will still exist. This section will provide the reader with a pictoral portrayal of this relationship.

6.1.4.2 Relationship Chart

Chart 10 is a graphic presentation of package interrelationships. The connecting lines and arrows show the flow of the information and the number associated with each line refers to an explanatory paragraph in Section 6.16.

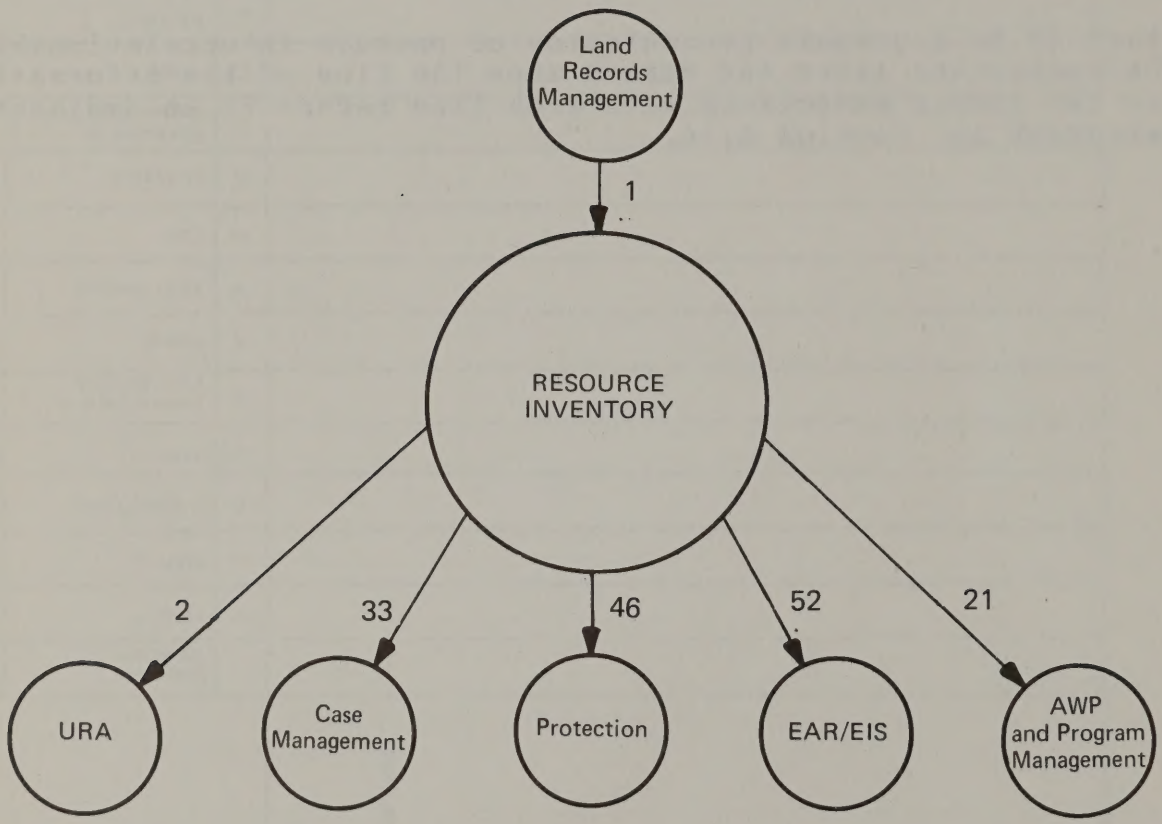

Chart 10. Package Interrelationships

6.1.5 Implementation Options

Converting existing type map and attribute data from its present form to the form required for the data base may be the most time consuming and expensive implementation task.

The system provides several tools that will aid the conversion process. A tablet and stylus can be used as a digitizer, to capture data directly from existing maps or aerial photographs. The programs that interpret the points and edit the data are another example of conversion aids.

The Resource Inventory Application Package is composed of the following tasks:

a. Planning

b. Field Collection

c. Interpretation and Analysis.

In addition the package can use as source data the following types of resource information:

a. Vegetation

b. Soils

c. Minerals

d. Geologic

e. Water

f. Wildlife

g. Meteorology

h. Recreation

i. Cultural.

Any mixture of source data types and tasks can be selected and combined for implementation to fit BLM needs. It should be noted that when a particular ADP capability is developed to support any

selected implementation, the capability will then be available to any implementation effort.

Any combination of data sources and tasks that produce a useful product could be implemented. For example; planning for the inventory of vegetative information or the actual field collection and interpretation of mineral information could be chosen independently or sequentially for implementation.

The choice of tasks and source data will affect conversion procedures drastically. If, for example, each district decided to implement the mineral resource maps for use in planning and analysis, the amount of data required would be much more than if the cultural type maps or recreation attribute data were converted for planning purposes first.

6.2 PLANNING-UNIT RESOURCE ANALYSIS (URA)

6.2.1 Introduction

6.2.1.1 Objective

The objective of the application package is to provide automated support for the processes and products required to produce a Unit Resource Analysis (URA) for each resource category (Lands, Minerals, Recreation, Wildlife, Watershed, Timber, Livestock Forage) within each BLM planning unit.

6.2.1.2 Tasks

The BLM tasks which will benefit from implementation of this package are:

a. Title page preparation

b. Location map preparation

c. Base map preparation

d. Physical profile preparation for:

    1. Topography

    2. Climate

    3. Hydrology

    4. Vegetation

    5. Soils

    6. Geology.

e. Analyze and record current resource situation for each of the seven resource categories

f. Analyze and record resource capabilities and opportunities for resource development for each of the seven resource categories

g. Maintenance and periodic revision.

6.2.1.3 Current Situation

6.2.1.3.1 Description

URAs are developed manually in single copy at the resource area level. Overlays are hand-drawn on mylar. Base maps may be done by cut-and-paste methods if not available in another form. Filing (storage) is accomplished either by hanging the overlays on a wall or by using large map cabinets. Narratives are typed and filed in regular filing cabinets.

6.2.1.3.2 Problem Areas

The current BLM situation involves the following problems:

a. All tasks with the exception of title page preparation require overlay products. 50 or more overlays per planning unit are required depending on the resource category and complexity of the area. The data which supports these overlays has:

1. Varying degrees of turbulance (i.e., geologic data is static while land use data is dynamic)

2. Varying degree of spatial detail and information content

Current methods of preparing and maintaining up-to-date overlays are too slow. The URA for a district becomes out-of-date before it is complete.

b. Mylar overlays present problems of maintenance and eventual replacement. Regardless of how carefully they are handled, deterioration cannot be avoided. Tearing, peeling, and smearing effects are usual.

c. These overlays are coming into increasing usage throughout the Bureau. Since only single copies of each mylar overlay are prepared, a problem of availability is emerging with increasing URA utility. A BLM planner or decision maker in need of a particular overlay may find it already in use. Unless the office has instituted a sign-out system or has duplicate copies, the specialist may have difficulty in locating it. Again, the increasing use of these overlays will tend to compound this problem.

d. Many tasks require narrative description-more than 50 per planning unit depending on the resource category and complexity of the planning unit area. Because of the high degree of turbulance of some of the data (land use, land ownership, frequent change in the resource condition), a major recurring writing, editing and clerical support effort is required.

e. Statistical tables to document one resource condition require:

   1. Time-consuming, manual retrieval of data from many sources. The sources are usually spatially dispersed:

      (a) BLM standard maps - BLM office

      (b) USGS topographic maps - other agency office - if not available in BLM office.

      (c) Water development data - private water development organizations, other agency offices.

   2. Manual calculations which are subject to arithmetic errors

   3. Clerical support for final copy which is subject to transposing errors, placement errors, etc.

f. Resource data, once gathered, should be retained for use in trend analysis. Because storage requirements increase over time and physical space which is readily

accessible to the user is limited, retention of valuable historical data becomes difficult.

g. If the resource specialist needs access to existing automated statistical data, the specialist must request a specific report (via mail or telephone) through the Denver Service Center Data Processing staff. The required computer program must then be scheduled through the Operation Staff (or written if the request is a new report format), and the output report mailed to the requesting site. This generally takes about a week. Because of ever-increasing workloads and responsibilities, this turn-around has become unacceptable. In many cases, the specialist currently receives significantly more data than he requested, and he must manually search for meaningful information.

6.2.1.3.3 Supporting Charts

Chart 1 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.2.1.2 to the problems identified in Section 6.2.1.3.2. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which problem areas

b. To show how widespread a problem is by presenting the number of application area tasks affected by that problem

c. Assuming that the more widespread a problem the higher priority for solution, it can be used as the basis for determining a schedule for implementing solutions.

PROBLEMS / TASKS	a. Preparing and maintaining up-to-date overlays too slow	b. Physical deterioration of overlays	c. Availability problem due to increased usage	d. Major effort to keep narratives up-to-date	e. Statistical tables difficult to generate manually and subject to errors	f. Storage problem for historical resource data	g. Turn-around time for getting information from DSC unacceptable					
a. Title page preparation												
b. Location map preparation	X	X	X									
c. Base map preparation	X	X	X									
d1. Topographic profile preparation	X	X	X	X								
d2. Climate profile preparation	X	X	X	X								
d3. Hydrology profile preparation	X	X	X	X		X						
d4. Vegetation profile preparation	X	X	X			X						
d5. Soils profile preparation	X	X	X	X		X						
d6. Geologic profile preparation				X								
e1. Analysis and recordation of current Lands situation	X	X	X	X	X	X	X					
e2. Analysis and recordation of current Minerals situation	X	X	X	X	X	X	X					
e3. Analysis and recordation of current Recreation situation	X	X	X	X	X	X						
e4. Analysis and recordation of current Wildlife situation	X	X	X	X	X	X						
e5. Analysis and recordation of current Watershed situation	X	X	X	X	X	X	X					
e6. Analysis and recordation of current Timber situation	X	X	X	X	X	X	X					
e7. Analysis and recordation of current Forage situation	X	X	X	X	X	X	X					
f1. Analysis and recordation of Lands capabilities	X	X	X	X		X						
f2. Analysis and recordation of Minerals capabilities	X	X	X	X		X						
f3. Analysis and recordation of Recreation capabilities	X	X	X	X		X						
f4. Analysis and recordation of Wildlife capabilities	X	X	X	X	X	X						

Chart 1. Problems vs Tasks

Chart 2 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.2.1.2 to the current BLM ADP support systems. The matrix is intended to show which application area tasks are currently supported in any degree by automation.

TASKS \ PROBLEMS	a. Preparing and maintaining up-to-date overlays too slow	b. Physical deterioration of overlays	c. Availability problem due to increased usage	d. Major effort to keep narratives up-to-date	e. Statistical tables difficult to generate manually and subject to errors	f. Storage problem for historical resource data	g. Turn-around time for getting information from DSC unacceptable					
f5. Analysis and recordation of Watershed capabilities	X	X	X	X		X	X					
f6. Analysis and recordation of Timber capabilities	X	X	X	X	X	X	X					
f7. Analysis and recordation of Forage capabilities	X	X	X	X	X	X						
g. Maintenance and periodic revision	X	X	X	X	X	X	X					

Chart 2. Problems vs Current ADP Support

6.2.1.4 Required ADP Capabilities

6.2.1.4.1 Decription

Structured Data Handling Update: Will provide efficient means of initializing and modifying the many statistical tables and reports which are outputs of each URA.

Structured Retrieval/Output: Assuming an integrated, well-organized data base and data base management system has been implemented, this capability provides 37% of all automated support. It is the tool which is used to search and display all the resource and lands data required by the URA preparer.

Mapping/Graphics Data Entry: Will provide the means of initially placing overlay data (digitized map data) and a very efficient means of modifying points, lines and perimeters on any URA overlay as resource conditions change.

Mapping/Graphics Retrieval/Output: Assuming a well-organized file management capability has been built into the digitized map data files, this single capability will provide almost one-fourth of the ADP capability necessary to support URA. It is the tool which is used to search and display at any scale all or part of any structured map data file.

Text Processing (Composition, Update, Retrieval): Will support the various URA narrative requirements in these ways:

- efficient editing of draft narrative text with minimal or no paper waste
- fast access to citations, abstracts, full texts to support URA tasks requiring historical or research information
- alleviate much of the manual clerical support required in producing a URA.

Special Processing: Will provide mathematical analyses of (a) current resource conditions carried into the future (b) current ecological conditions carried into the future (c) classification schemes (such as determining the limits of geographic classification ratings required for the Ecological Profile).

Computer Assisted Training: Will provide the UPA preparer ready access to instructions on how to use automated mathematical techniques, how to input requirements as parameters and how to operate hardware and software to produce URA information/product.

6.2.1.4.2 Supporting Charts

Chart 3 is a matrix which presents the relationship of the application area tasks and subtasks described in detail in Section 6.2.1.2 to the required ADP capabilities identified, specifically, in Section 6.2.1.4.1 and, generally Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required to support the application area tasks and subtasks

b. To show which ADP capabilities provide the most support throughout the application area

c. Assuming the more tasks associated with an ADP capability associated with the greater the need for its development, it can be used as a basis for determining a schedule for development.

TASKS / CURRENT ADP SUPPORT SYSTEMS	a. Title page preparation	b. Location map preparation	c. Base map preparation	d. Preparation & recordation of ecological profile	e. Analyze & record present situation	f. Analysis & recordation of resource capability & opportunity for development	g. Maintenance and periodic revision					
CRIS		X		X								
Map Model		X		X								

Chart 3. ADP Capabilities vs Tasks

Chart 4 is a matrix which presents the relationship of the required ADP capabilities described in detail in Section 6.2.1.4.1 and generally in Appendix A to the problems identified in Section 6.2.1.3.2. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are needed to help solve the problems in the application area

b. To show which ADP capabilities provide the most support, i.e., help solve the most problems

c. Assuming the more problems solved by an ADP capability the greater the need, it can be used as the basis for determining a schedule for development.

Chart 4. ADP Capabilities vs Problems

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
		Retrieval/ Output																			
	Update	Pre-defined	Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Title page preparation		X																		X	
b. Location map preparation					X															X	
c. Base map preparation					X															X	
d. Profile preparation																					
1. Analyze current resource status and current narrative status for necessary modifications		X	X				X												X		
2. Update profile narrative as necessary						X													X		
3. Publish revised profile narrative								X												X	
4. Analyze current resource status and current overlay status for necessary modifications		X	X		X														X		
5. Update overlay as necessary				X															X		
6. Publish revised overlay narrative					X															X	
e. Analyze and record current resource situation																					
1. Compare current URA overlays against current resource inventory data		X	X		X														X		
2. Update URA overlays to reflect current resource conditions				X															X		
3. Compare current URA statistical data against current resource inventory data		X	X																X		
4. Update URA statistical data to reflect current resource conditions	X																		X		
5. Compare current URA narratives to current resource inventory data	X	X					X												X		
6. Update URA narratives to reflect current resource conditions					X														X		
f. Analysis and recordation of resource capability and opportunity for development																					

Chart 4. ADP Capabilities vs Problems (Continued)

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
1. Obtain information from trend studies, plans from private and government groups and management practices		X	X		X		X												X		Textual retrieval will include abstracts and bibliography of other agency and private organization studies and plans
2. Analyze information in terms of predicting full potential for each resource			X						X						X				X		Special processes include mathematical analyses of current resource situations carried into the future and controlled by parameters inputted by the resource analyst
3. Prepare overlays depicting resource opportunity and capability at full potential				X															X		
4. Prepare supporting narratives keyed to the overlays describing resource opportunity and capability at full potential					X			X											X		
5. Prepare supporting tabulations which show future condition statistics keyed to the overlays		X	X		X														X		
g.* Preparation and recordation of ecological profile																					
1. Determine biomes and major communities from physical profile data, texts or other available sources		X			X		X												X		
2. Add biome and community delineations to vegatative profile overlay				X															X		
3. Prepare narratives describing planning unit biomes and communities		X			X			X											X		

*This is a proposed addition to the URA as described in Manual Draft 1605.5

Chart 4. ADP Capabilities vs Problems (Continued)

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
4. Extract data from physical profile and URA Step 3 that act as ecological change		X	X				X												X		
5. Prepare overlay work sheet using extracted data				X															X		
6. Analyze ecological relationships to determine classification and trend ratings			X		X		X		X										X		Based on user-defined parameters defining classification rating factor ranges, computer processes can assist in determining the geographic class locations
7. Update ecological overlay work sheet with delineations showing each classification rating				X															X		
8. Prepare ecological profile overlay using worksheet delineations				X	X														X		
9. Prepare supporting narrative describing each delineated quality class area					X			X											X		
10. Prepare supporting tabulations showing acreage statistics for each class area by trend		X																	X		
11. Extract data from URAs Step IV, texts or other available sources which are potential ecological class change agents		X			X		X												X		
12. Analyze information to determine where class ratings can be impcoved			X						X						X				X		Special processes include mathematical analyses of current ecological situation carried into the future and controlled by parameters defined by the resource specialist
13. Prepare tabulations showing future acreage statistics for each predicted class area		X																	X		
14. Prepare narratives supporting each table describing each predicted class area								X											X		

Chart 4. ADP Capabilities vs Problems (Continued)

ADP CAPABILITIES / PROBLEMS	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Preparing and maintaining up-to-date overlays too slow				X	X														X	X	
b. Physical deterioration of overlays				X	X																
c. Availability problem due to increased usage					X														X	X	
d. Major effort to keep narratives up-to-date						X	X	X											X	X	
e. Statistical tables difficult to generate manually and subject to errors	X	X	X																X	X	
f. Storage problem for historical resource data		X	X	X															X	X	
g. Turn around time for getting information from DSC unacceptable.																			X	X	terminal operation

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6.2.2 Benefits

6.2.2.1 Introduction

The benefits fo applying specified ADP capabilities to problems in the current BLM situation can be measured in terms of:

a. URA products produced more efficiently i.e., once stored, there is a reduction in specialist's time spent in manually compiling and color-coding overlays and manually compiling statistical and narrative documentation.

b. More usefulness to URA products:

   1. Easier access to the products promotes usability.

   2. Support for maintaining up-to-date products promotes use.

c. Turn-around time reduced (time between initialization of request for URA information and receipt of the information).

d. Reduced physical space requirements for files to store overlays and URA support data.

6.2.2.2 Detailed Benefits

These terms for measuring benefits can be applied to each of the following specific benefits.

a. Original map data (from SCS, USGS, USFS, etc) once stored using ADP equipment have the following automated benefits:

   1. Quick reproductions at any scale making overlays available to the resource specialist (or other user) at a common scale

   2. Reproduction in smaller selected sections allowing the resource specialist (or other user) to

coordinate functional boundaries with administrative (planning unit) boundaries.

3. Joining of two or more geographically connected source maps of same or different scales and reproduced at a common scale as one map.

It will no longer be necessary for the resource specialist to manually create overlays at a common scale, or change scales or extract some section of an overlay.

b. Products do support Step IV of each URA often involve compilation of data presented in Step III in a different form (i.e., Minerals URA Step III and IV). Having the capability for:

1. Automated user-dictated reformatting

2. Automated reproduction of the data.

Allows the resource specialist more time to apply professional judgement and creative effort to the determination of resource development opportunities instead of spending time manually duplicating and rearranging the basic data.

c. Predicting resource values and development potential for the future (100 or more years in the Minerals cases) requires the interaction of so many variables over such an extended period of time that, without computerized analysis, the predictions are too time-consuming and tentative to be of benefit. Automated access to historic supply and demand data and technologic trend data to drive a computerized model affords long-range and complex resource developmnet prediction based on a statistically sound trend analysis. (i.e., ability to forecast a productive range area by knowing which variables and combinations of variables are good indications to production management ability).

d. Automated analytical modeling can be applied to all URA resource categories, i.e., mathematical prediction of potential mineral information based on any combination of physical and/or resource characteristics of known

mineral data with the result displayed in graphic (overlay) format. The models require digital data inputs but have the capability of statistical, tabular or graphical output formats. These outputs can be formatted for URA overlay and narrative compatability:

1. In Step III where current resource data is not available and must be predicted based on past resource data

2. In Step IV for identifying future trends and potential conditions.

e. Narrative descriptions required in various URA steps, once stored, can be immediately retrieved as final copy, with or without modifications reflecting changed resource conditions. This will save the URA preparer significant writing and editing thus allowing him more time for resource analysis and technical decisions.

f. Using combinations of ADP capabilities, the resource specialist will have URA source data accessible within minutes of initiating a request. He will have the benefit of a temporary visual display that he can reproduce as hard copy after verifying his need for it.

g. When determining opportunity for development of a resource there are many variables which may affect opportunity in varying degrees. Many variables in combination with each other may significantly affect opportunity while having little significance by themselves. Using automated, interactive computer models to mathematically determine influencing factors for potential development (i.e., of a mineral deposit) it will often be possible for a manager without technical training to follow the resource, ecomonic and technological developments which affect the mineral deposit potential for production.

h. Using automated analytical processes, delineation of a geographic area into resource management recommendation areas can be accomplished within minutes based on the resource manager's parameter inputs regarding:

1. Which values (attributes) are to be preserved or

2. Similar management techniques or

3. Similar rehabilitation requirements.

Outputs can be statistical tables and/or overlays and/or narratives.

i. The problem of URA overlay deterioration from frequent access-retrieval actions is eliminated. Computer-stored data, in any format, is not subject to deterioration from use. It is also available to multiple users concurrently.

6.2.2.3 Supporting Charts

Chart 5 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.2.1.2 to the anticipated benefits identified in Section 6.2.2.2 and the output products. The matrix is intended to serve four purposes:

a. To provide a list of the generic products associated with a task.

b. To show the anticipated benefits associated with a particular task.

c. Assuming that the more anticipated benefits associated with a task the greater the gain to BLM, it can be used as the basis for determining a schedule for implementation

d. To show how widespread a benefit is by presenting the number of application area tasks affected by the benefit.

TASKS	PRODUCTS	BENEFITS										
		a. Quick scale change and joining or dividing overlays	b. Ease of using some data in different formats for different URA steps	c. Long range resource development predictions	d. Auto. prediction po. resource cond. var. outpt format	e. Narratives more easily created and changed	f. Temporary visual displays of URA data save paper	g. More effective and easier analysis of opportunity for development	h. Easy delineation of recommendation areas	i. No URA overlay deterioration and multiple users is possible		
a. Title page preparation	• Title page showing state, district, resource area, planning unit and signatures of URA reviewing officials						X					
b. Location map preparation	• Line map showing planning unit location within the resource area, district and state	X					X			X		
c. Base map preparation	• Base map showing survey grid, land status, physical improvements	X					X			X		
d1. Topographic profile preparation	• Topographic narrative description • Optional topographic overlay	X				X	X			X		
d2. Climate profile preparation	• Climatic narrative description • Climatic overlay	X				X	X			X		
d3. Hydrology profile preparation	• Hydrologic color coded overlay • Hydrologic narrative description	X				X	X			X		
d4. Vegetation profile preparation	• Vegetative type color coded overlay	X					X			X		
d5. Soils profile preparation	• Soils association color coded overlay • Soils profile narrative	X				X	X			X		
d6. Geologic profile preparation	• Geologic narrative description					X	X					
e1. Analysis & recordation of current Lands situation	• Land use narrative • Current land use color coded overlay • Statistical tables showing: – ownership breakdowns – ownership by county – federal ownership by agency • Lands classification overlay and narrative • Lands withdrawal overlay and narrative • Permits and leasing overlay and narrative											

Chart 5. Tasks vs Products and Benefits

TASKS	PRODUCTS	BENEFITS											
		a. Quick scale change and joining or dividing overlays	b. Ease of using some data in different formats for different URA steps	c. Long range resource development predictions	d. Auto. prediction po. resource cond. var. outpt format	e. Narratives more easily created and changed	f. Temporary visual displays of URA data save paper	g. More effective and easier analysis of opportunity for development	h. Easy delineation of recommendation areas	i. No URA overlay deterioration and multiple users is possible		
e1. (cont.)	• Lands disposal color coded overlay • Statistical table showing land disposal acreage by disposal category • Lands disposal narrative • Open space values overlay and narrative	X			X	X	X			X		
e2. Analysis & recordation of current Minerals situation	• Mineral Inventory overlay • Mineral leasing overlay • Mineral status overlay • Statistical tables showing: – acreage by kind of lease – mineral production • Narrative descriptions of: – mineral prodiction and trends – current and past exploration – active mining & exploration companies	X			X	X	X			X		
e3. Analysis & recordation of current Timber situation	• Timber inventory & forest type color coded overlay • Statistical tables showing: – acreage & volume by forest type – volume & value of vegetative sales • Timber resource narrative	X			X	X	X			X		
e4. Analysis & recordation of current Forage situation	• Statistical tables showing: – acreage by vegetative type – acreage of weed infestation by species – seasonal use by allotment/lease – lease data by allotment • Livestock Vegetation problem narrative • Noxious & poisonous weed narrative • Grazing allotment narrative • Seasonal designation discussion											

Chart 5. Tasks vs Products and Benefits (Continued)

TASKS		PRODUCTS	BENEFITS										
			a. Quick scale change and joing or dividing overlays	b. Ease of using some data in different formats for different URA steps	c. Long range resource development predictions	d. Auto. prediction po. resource cond. var. outpt format	e. Narratives more easily created and changed	f. Temporary visual displays of URA data save paper	g. More effective and easier analysis of opportunity for development	h. Easy delineation of recommendation areas	i. No URA overlay deterioration and multiple users is possible		
e4.	(cont.)	• Grazing management system discussion • Forage development description • Management support facilities narrative • Established allotment overlay • Seasonal use area overlay • Forage development site types overlay • Management facilities overlay	X			X	X	X			X		
e5.	Analysis & recordation of current Watershed situation	• Erosion class color coded overlay • Erosion classification Tabulation • Erosion condition narrative • Completed improvements overlay • Statistical tables showing: – improvements by practice • Past and present treatments & improvements discussion • Problems and needs narrative	X			X	X	X			X		
e6.	Analysis & recordation of current Wildlife situation	• Wildlife concentration area overlays for: – big game – upland game – waterfowl – fish – rare & endangered specifies											
		• Statistical tables showing: – amounts of habitat & development projects by species – wildlife utilization by habitat type and species – wildlife utilization by species and people – commercial wildlife harvest by use	X	X	X	X	X	X			X		

Chart 5. Tasks vs Products and Benefits (Continued)

TASKS		PRODUCTS	BENEFITS										
			a. Quick scale change and joining or dividing overlays	b. Ease of using some data in different formats for different URA steps	c. Long range resource development predictions	d. Auto. prediction po. resource cond. var. outpt format	e. Narratives more easily created and changed	f. Temporary visual displays of URA data save paper	g. More effective and easier analysis of opportunity for development	h. Easy delineation of recommendation areas	i. No URA overlay deterioration and multiple users is possible		
e6.	(cont.)	• Optional narratives to support overlays and tables											
e7.	Analysis & recordation of current Recreation situation	• Scenic category overlay • Cultural features overlay • Geologic features overlay • Snow and ice features overlay • Ecological features overlay • Primitive area overlay • Recreation site overlay • People influence zones overlay • Access overlay • Narrative discussion keyed to each aspect of the nine overlays listed above • Water body narrative • Statistical tables showing: – visitor use data by area – recreation values by site types	X			X	X	X			X		
f1.	Analysis & recordation of Lands capabilities	• Lands Activity Potential overlay • Lands activity potential narrative	X	X	X	X	X	X	X	X	X		
f2.	Analysis & recordation of Minerals capabilities	• Potential mineral production overlay • Potential mineral production narrative	X	X	X	X	X	X	X	X	X		
f3.	Analysis & recordation of Timber capabilities	• Timber production capability overlay • Intensive management narrative • Statistical tables showing: – acreage & volume by type for each capability class	X	X	X	X	X	X	X	X	X		
f4.	Analysis & recordation of Forage capabilities	• Grazing system potential areas overlay • Management treatment potential areas overlay • Statistical tables showing: – Potential production figures by development practice	X	X	X	X	X	X	X	X	X		

Chart 5. Tasks vs Products and Benefits (Continued)

TASKS	PRODUCTS	BENEFITS										
		a. Quick scale change and joining or dividing overlays	b. Ease of using some data in different formats for different URA steps	c. Long range resource development predictions	d. Auto. prediction po. resource cond. var. outpt format	e. Narratives more easily created and changed	f. Temporary visual displays of URA data save paper	g. More effective and easier analysis of opportunity for development	h. Easy delineation of recommendation areas	i. No URA overlay deterioration and multiple users is possible		
f4. (cont.)	– Potential production figures by grazing system implementation • Optical narratives to support statistical tables											
f5. Analysis & recordation of Watershed capabilities	• Watershed opportunity by treatment area overlay • Watershed treatment and management area narrative	X	X	X	X	X	X	X	X	X		
f6. Analysis & recordation of Wildlife capabilities	• Overlay of potential habitat increase areas by various added habitat components for: – big game – upland game – waterfowl – fish – rare & endangered species • Statistical tables showing: – acreage/stream increases by habitat component change – sport days increase by habitat component change • Potential habitat condition descriptions	X	X	X	X	X	X	X	X	X		
f7. Analysis & recordation of Recreation	• Geographic recommendation areas overlay • Opportunities and benefits narrative	X	X	X	X	X	X	X	X	X		
g. Maintenance & periodic revision	• Up-to-date overlays (over 50) required per planning unit • Up-to-date narratives (over 55) which are coordinated and keyed to the overlays and tables • Up-to-date statistical tables which can reflect data as current as 24 hours	X	X	X	X	X	X	X	X	X		

Chart 5. Tasks vs Products and Benefits (Continued)

Chart 6 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.2.1.2 to the potential BLM users of products generated when the task is automated. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which users

b. To show how many users will receive products from automation of the particular task

c. Assuming that the more anticipated users, the higher the priority for implementation, it can be used as a basis for determining an implementation schedule.

USERS / TASKS	Area Staff	District Staff Specialist									
a. title page preparation	X										
b. location map preparation	X										
c. base map preparation	X										
d1. topographic profile preparation	X										
d2. climate profile preparation	X										
d3. hydrology profile preparation	X	X									
d4. vegetation profile preparation	X										
d5. soils profile preparation	X	X									
d6. geologic profile preparation		X									
e1. analysis & recordation of current Lands situation	X	X									
e2. analysis & recordation of current Minerals situation		X									
e3. analysis & recordation of current Recreation situation	X	X									
e4. analysis & recordation of current Wildlife situation	X	X									
e5. analysis & recordation of current Watershed situation	X	X									
e6. analysis & recordation of current Timber situation	X	X									
e7. analysis & recordation of current Forage situation	X										
f1. analysis & recordation of Lands capabilities	X	X									

Chart 6. Tasks vs Users

USERS / TASKS	Area Staff	District Staff Specialist										
f2. analysis & recordation of Minerals capabilities		X										
f3. analysis & recordation of Recreation capabilities	X											
f4. analysis & recordation of Wildlife capabilities	X	X										
f5. analysis & recordation of Watershed capabilities	X											
f6. analysis & recordation of Timber capabilities	X	X										
f7. analysis & recordation of Forage capabilities	X											
g. Maintenance & periodic revision	X											

Chart 6. Tasks vs Users (Continued)

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Chart 7 is a matrix which presents the relationship of the anticipated benefits described in detail in Section 6.2.2.2 to the required ADP capabilities identified specifically in Section 6.2.1.4.1 and generally in Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required by this application area to realize the anticipated benefits

b. To show which ADP capabilities provide the most support in terms of the number of benefits associated with a particular ADP capability

c. Assuming the more anticipated benefits associated with an ADP capability the greater the need for the capability, it can be used as the basis for determining a development schedule.

Chart 7. Benefits vs ADP Capabilities

BENEFITS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Quick scale change and joining or dividing overlays					X														X		
b. Ease of using same data in different formats for different URA steps			X		X		X												X	X	
c. Long range resource development predictions									X										X	X	
d. Automatic prediction of potential resource condition with variable output format									X			X	X	X					X	X	
e. Narratives more easily created and changed						X	X	X											X		
f. Temporary visual displays of URA data-save paper					X														X		
g. More effective and easier analysis of opportunities for development			X		X				X										X	X	
h. Easy delineation of recommendation areas					X														X	X	
i. No URA overlay deterioration and multiple users possible					X														X	X	

6.2.3 Requirememts

6.2.3.1 Introduction

In order to implement this application package, certain requirements must be met. These requirements are displayed on the following charts in terms of:

a. Data set requirements

b. Supplier responsibility

c. Input requirements from other application areas.

6.2.3.2 Supporting Charts

Chart 8 is a matrix which presents the data sets described in detail in Table 5-1 and in general in Appendix B that will be used by the application area tasks described in detail in Section 6.2.1.2. The matrix is intended to serve three purposes:

a. To show which data sets are required to execute application area tasks

b. To show how much use is made of a data set by representing the number of tasks within an application area that use the data set.

c. To show how the particular task uses the data in the data set, i.e., just displays the data, (R) adds new data (W) or corrects existing data. (R/W)

Chart 8. Tasks vs Data Sets

TASKS	DATA SETS																					
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	Program Plans	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
a. Title page preparation																						
b. Location map preparation										R/*												
c. Base map preparation										R/*							R					
d1. Topographic profile preparation				R/*																		
d2. Climate profile preparation							R/*											R-1				
d3. Hydrology profile preparation					R/*																	
d4. Vegetation profile preparation	R/*																					
d5. Soils profile preparation		R/*																				
d6. Geologic profile preparation			R/*																			
e1. Analysis and recordation of current Lands situation	R/*			R/*	R/*					R/*	R	R										
e2. Analysis and recordation of current Minerals situation			R/*							R/*	R	R						R-2				
e3. Analysis and recordation of current Recreational situation	R/*			R/*	R/*	R/*	R/*				R											
e4. Analysis and recordation of current Wildlife situation	R/*				R/*						R											
e5. Analysis and recordation of current Watershed situation	R/*	R/*					R/*															
e6. Analysis and recordation of current Timber situation	R/*	R/*		R/*			R/*															
e7. Analysis and recordation of current Forage situation	R/*				R/*						R											

Chart 8. Tasks vs Data Sets (Continued)

TASKS	DATA SETS																					
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	Program Plans	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
f1. Analysis and recordation of Lands capabilities												R							R/W			
f2. Analysis and recordation of Minerals capabilities												R							R/W		R	
f3. Analysis and recordation of Recreation capabilities												R							R/W		R	
f4. Analysis and recordation of Wildlife capabilities																			R/W		R	
f5. Analysis and recordation of Watershed capabilities																			R/W		R	
f6. Analysis and recordation of Timber capabilities												R							R/W		R	
f7. Analysis and recordation of Forage capabilities												R							R/W		R	
g. Maintenance and periodic revision	R/*	R/*	R/*	R/*	R/*	R/*	R/*	R/*	R/*	R/*	R	R					R	1/2	R/W		R	

1. Abstracted data from other agencies

2. Abstracts, bibliographies and other references to Minerals and Mining research

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The symbols used at the intersections have the following meanings:

R - Indicates that the data in the data set is read, i.e., displayed on a video screen, in a report, etc., but no updating of the data takes place. This is just a visual display of the data for review, auditing, information, etc. For example, the resource specialist would want to examine previous resource surveys in a paticular area before making a field trip. To do this the various resource data sets are interrogated to determine if a resource survey was performed in the desired area and if so, what information was gathered in each resource category. This could be done initially using a video device and if the information is useful a hard copy could be obtained.

W - Indicates that the data set or a logical record is initially created without immediate review. An audit trail or error listing may be produced as a result of this update but no use is made of the updated data set. For example, a large amount of information may be added to a data set which would involve a time consuming effort to enter, edit and correct each transaction.

R/W - Indicates the data set is:

1. Created or updated and then used to produce a product. That is, the resource specialist enters the field collected data into the data set, makes corrections, if necessary, and the new data is displayed in a report.

2. Read and after some analysis data in the set is updated. For example, the resource specialist, prior to a field trip, could be perusing resource information from a resource area and, because of that specialist's knowledge of the area, fill in missing information.

R/* - Indicates that while reading the data in a data set a conflict with information in a second data set is

discovered. No corrective action is taken at this time. For example, if the resource specialist was examining UPAs in the secialists discipline and a discrepancy was noted with the previously examined resource inventory data, a field trip would be required before the discrepancy could be corrected.

It should be noted that the symbol used represents the most common usage of a data set by a task. This does not mean however that another function cannot be performed. The common procedure may be to read (R) only, but on occasion a write (W) or conflict reduction (R/*) may be done.

Detailed menus for each data set are found in Phase IV of the report.

Chart 9 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.2.1.2 to data maintained in other application areas and BLM personnel responsible for supplying application input data. The matrix is intended to serve three purposes:

a. To show which other application areas furnish information to the application area task

b. To show the personnel position titles within BLM which are responsible for providing information to the application area task

c. It may indicate critical application area linkages, which would affect the implementation sequence.

Chart 9. Tasks vs Application Area Inputs and Supplier Responsibility

Sheet 1 of 2

TASKS	APPLICATION AREA INPUTS															SUPPLIERS							
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	EAR/EIS	Regional Analysis	Protection	District Technician/ Aide	District Resource Specialist	District Forester District Range Conserv.	District Realty Specialist	District Nat. Resource Specialist	District Outdoor Recreation Planner	District Wildlife Biologist	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15								
a. title page preparation																X							
b. location map preparation																X							
c. base map preparation								X				X				X							
d1. topographic profile preparation	X																X						
d2. climate profile preparation	X																X						
d3. hydrology profile preparation	X																X						
d4. vegetation profile preparation	X																	X					
d5. soils profile preparation	X																X						
d6. geologic profile preparation	X																X						
e1. analysis & recordation of current Lands situation	X							X	X	X				X					X				
e2. analysis & recordation of current Minerals situation	X							X	X	X				X						X			
e3. analysis & recordation of current Recreation situation	X											X		X							X		
e4. analysis & recordation of current Wildlife situation	X																					X	
e5. analysis & recordation of current Watershed situation	X																			X			

Chart 9. Tasks vs Application Area Inputs and Supplier Responsibility (Continued)

Sheet 2 of 2

TASKS	APPLICATION AREA INPUTS															SUPPLIERS						
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	EAR/EIS	Regional Analysis	Protection	District Forester	District Range Conservationist	District Realty Specialist	District Natural Resource Specialist	District Outdoor Recreation Planner	District Wildlife Biologist	All the above
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15							
e6. analysis & recordation of current Timber situation	X															X						
e7. analysis & recordation of current Forage situation	X																X					
f1. analysis & recordation of Lands capabilities	X							X	X	X				X				X				
f2. analysis & recordation of Minerals capabilities	X			X										X					X			
f3. analysis & recordation of Recreation capabilities	X			X										X						X		
f4. analysis & recordation of Wildlife capabilities	X			X										X							X	
f5. analysis & recordation of Watershed capabilities	X			X															X			
f6. analysis & recordation of Timber capabilities	X			X										X		X						
f7. analysis & recordation of Forage capabilities	X			X													X					
g. Maintenance & periodic revision	X	X		X				X	X	X		X		X								X

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6.2.4 Application Package Relationships

6.2.4.1 Introduction

The following schematic displays the relationship of the URA application to application areas which support URA and application areas which are supported by URA. The numbers associated with each arrow refer to narrative paragraph in Section 6.16 which describes the relationship.

6.2.4.2 Relationship Chart

Chart 10 is a graphic presentation of package interrelationships.

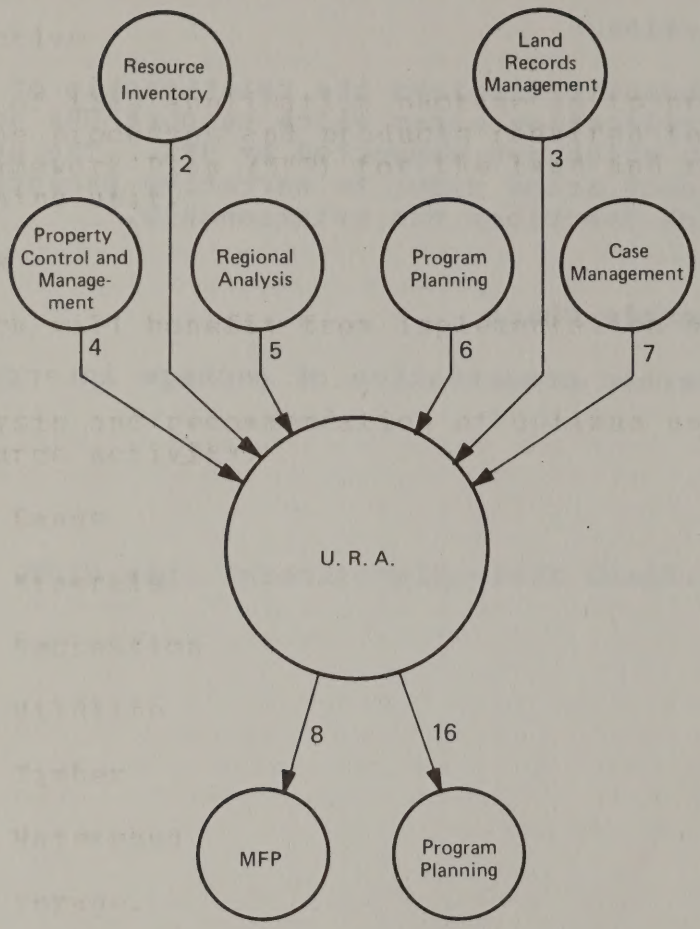

Chart 10. Package Interrelationships

6.2.5 Implementation Options

Should the Bureau decide to implement this package in smaller increments than full support of the URA, there are many combinations of URA procedures and activities which can be developed independently of each other without creating repetitive development work and which provide useable BLM products for the URA function.

URA implementation options include:

a. Lands

b. Minerals and Energy

c. Recreation

d. Wildlife

e. Watershed

f. Timber

g. Livestock Forage.

For example, it would be possible to implement Minerals and Energy graphics support along with Livestock Forage statistics in one fiscal year and implement narrative support across all activities the next fiscal year.

The ability to implement the URA workload in this way allows the Bureau to phase total support according to personnel and dollar resources and according to demand for services.

6.3 PLANNING: MANAGEMENT FRAMEWORK PLAN (MFP)

6.3.1 Introduction

6.3.1.1 Objective

The objective of this application package is to provide automated support for the processes and products required to produce a Management Framework Plan (MFP) for the land and resources within each BIM planning unit.

6.3.1.2 Tasks

The tasks which will benefit from implementation of this package are:

a. Analysis and recommendation of optimum use of each resource activity:

   1. Lands
   2. Minerals
   3. Recreation
   4. Wildlife
   5. Timber
   6. Watershed
   7. Forage.

b. Identification, analysis, coordination and recordation of overlaps and conflicts among resource activities

c. Determination and recordation of needed support program activity actions:

   1. Cadastral survey
   2. Fire protection and rehabilitation
   3. Roads and trails construction and maintenance

4. Buildings and yards contruction and maintenance.

d. Determination and recordation of contingency alternatives

e. Decision of which finalized program activity recommendations to adopt and to what extent

f. Maintenance and periodic revision.

6.3.1.3 Current Situation

6.3.1.3.1 Description

MFPs are developed manually in single copy at the resourse data level. Overlays are hand-drawn on mylar. Base maps may be done by cut-and-paste method if not available in another form. Filing (storage) is accomplished by either hanging the overlays on a wall or by using large map cabinets. Narratives are typed and filed in regular filing cabinets.

6.3.1.3.2 Problem Areas

The current BLM situation involves the following problems in producing and maintaining a Management Framework Plan:

a. Mylar overlays present problems of maintenance and eventual replacement. Regardless of how carefully they are handled, deterioration cannot be avoided. Tearing, smearing and peeling effects are usual.

b. These overlays are coming into increasing usage throughout the Bureau. Since only single copies of each mylar overlay are prepared, a problem of availability is emerging with increased MFP utility. A BLM planner or decision maker in need of a particular overlay may find it already in use. Unless the office has instituted a sign-out system or has duplicate copies, the resource specialist may have difficulty locating it. Again, the increasing use of these overlays will tend to compound this problem.

c. A fully documented, coordinated MFP takes so long to prepare that it is often out-of-date before it is complete. The district needs a faster way of generating overlays, accessing source information (UPA data, social, economic, political profiles, applicable environmental reports) and identifying conflicts.

d. Mylar overlays for defining and analyzing planning unit resource data in terms of combinations of characteristics are not useable. It is not possible to see through more than 3 or 4 overlays at a time and with present manual techniques identifying all conflicts in a comprehensive way is not practical.

e. Resource relationship complexity increases geometrically to the number of resources being inter-related. In order to visually study these complexities it is necessary to reproduce smaller sections at larger scales. Today there are only 2 alternatives for determining resource program relationships:

   1. Initially combining all seven overlays into one overlay. This is not only a manual, time-consuming process but is inflexible and complex.

   2. Superimposing overlays over each other and documenting all overlaps and conflicts. Assuming just one overlay for each recommendation area (many times there are more than 1), as many as 90 combinations are possible considerations.

f. Updating a Management Framework Plan is time consuming and tedious in today's organization. There may be as many as 100 overlays to a fully documented MFP. A change in one resource condition could easily affect 20% of them.

   Limited manpower and time require personnel to perform tasks of higher priority than MFP documentation maintenance. As a result, MFPs become out-of-date and are not used for program guidance as they should be.

g. There is major refining and editing done to program activity recommendation narratives as they progress through the MFP process. This requires substantial

clerical support and, unless copies of the narratives are kept, they are not available while typing, editing or retyping is being performed.

h. Environmental impact statements and other environmental reports are basic to the completion of the optimum use analysis task and contingency analysis task. These documents are prepared by all agencies-public and private. Knowledge of their existence is limited to the district researcher and his immediate co-workers and access to them may be very difficult. The Bureau needs a standard way to record existence of environmental reports when completed and a means of access to the recorded information.

6.3.1.3.3 Supporting Charts

Chart 1 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.3.1.2 to the problems identified in Section 6.3.1.3.2. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which problem areas

b. To show how widespread a problem is by presenting the number of application area tasks affected by that problem

c. Assuming that the more widespread a problem the higher priority for solution, it can be used as the basis for determining a schedule for implementing solutions

PROBLEMS / TASKS	a. Maintenance, deterioration and replacement of overlays	b. Availability due to increasing use	c. MFPs are out-of-date before complete	d. Conflict ID using overlays doesn't work	e. Procedures for studying resource relationships too slow	f. Updating MFP is slow and other jobs more important so MFP gets out-of-date	g. Major narrative effort that takes a lot of time	h. Access to supporting data (EAR/EIS) not adequate				
a1. Analysis and recommendation of Lands optimum use	X	X	X	X			X	X				
a2. Analysis and recommendation of Minerals optimum use	X	X	X	X			X	X				
a3. Analysis and recommendation of Recreation optimum use	X	X	X	X			X	X				
a4. Analysis and recommendation of Wildlife optimum use	X	X	X	X			X	X				
a5. Analysis and recommendation of Timber optimum use	X	X	X	X			X	X				
a6. Analysis and recommendation of Watershed optimum use	X	X	X	X			X	X				
a7. Analysis and recommendation of Forage optimum use	X	X	X	X			X	X				
b. Identification analysis coordination and recordation of overlaps and conflicts among resource activities	X	X	X	X	X		X					
c1. Determination and recordation of needed Cadastral support	X	X	X	X			X					
c2. Determination and recordation of needed fire protection and rehabilitation supports	X	X	X	X			X					
c3. Determination and recordation of needed roads and trails support	X	X	X	X			X					
c4. Determination and recordation of needed Buildings and Yards support	X	X	X	X			X					
d. Determination and recordation of Contingency Alternatives	X	X	X	X	X		X	X				
e. Multiple use decision on which activity plans to adopt and to what extent	X	X	X	X								
f. Maintenance and periodic revision	X	X	X	X	X	X	X	X				

Chart 1. Problems vs Tasks

Chart 2 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.3.1.2 to the current BLM ADP support systems. The matrix is intended to show which application area tasks are currently supported in any degree by automation.

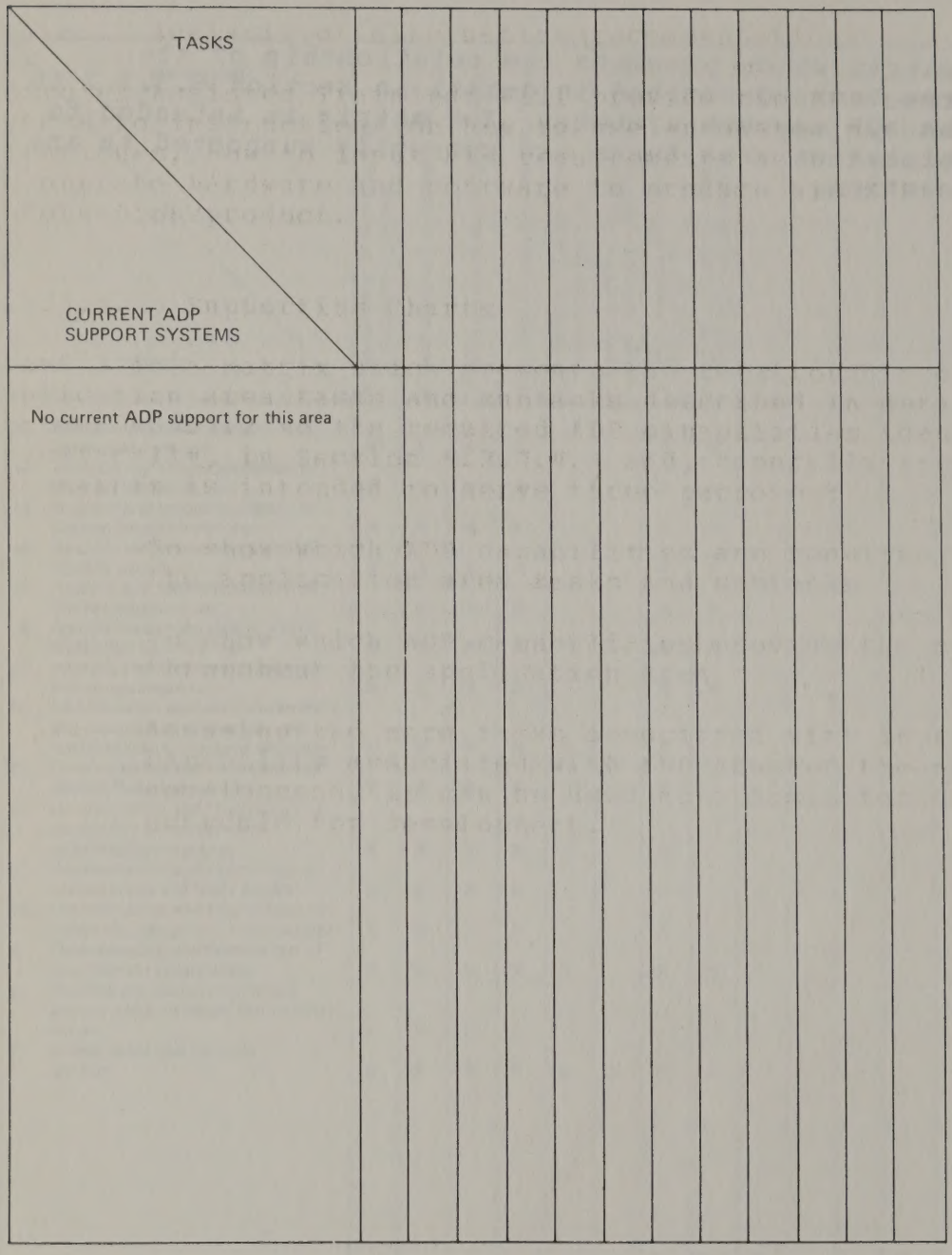

Chart 2. Problems vs Current ADP Support

6.3.1.4 Required ADP Capabilities

6.3.1.4.1 Description

Structured Retrieval/Output: Assuming an integrated, well-organized data base and data base management system has been implemented, this capability will provide the tool which is used to search and display all the URA and support data required by the MFP preparer.

Mapping/Graphics Data Entry: Will provide the means of initially placing overlay data (digitized map data) and a very efficient means of modifying points, lines and perimeters on any MFP overlay as resource conditions an social-economic factors change in any area. This capability provides almost 1/5 of all automated support needed for MFP.

Mapping/Graphics Retrieval/Output: Assuming a well-organized file management capability has been built into the digitized map data files, this single capability will provide almost one-fifth of ADP support necessary to an MFP. It is the tool which is used to search and display at any scale all or part of any structured map data file.

Text Processing (Composition, Update, Retrieval): Will support the various MFP narrative requirements in these ways:

a. Efficient editing of draft narrative text with minimal or no paper waste.

b. Fast access to citations, abstracts, full texts to support MFP tasks requiring historical or research information

c. Alleviate much of the manual clerical support required in producing a MFP.

Text processing capabilities provide almost 1/3 of all ADP support needed for an MFP.

Special Processing: Will provide mathematical analysis of

a. Optimum use determinations

b. Conflict identification

c. Analysis of alternative recommendations

Computer Assisted Training: Will provide the MFP perparer ready access to instructions on how to use automated mathematical techniques, how to input his requirements as parameters and how to operate hardware and software to produce his MFP information/product.

6.3.1.4.2 Supporting Charts

Chart 3 is a matrix which presents the relationship of the application area tasks and subtasks described in detail in Section 6.3.1.2 to the required ADP capabilities identified, specifically, in Section 6.3.1.4.1 and, generally Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required to support the application area tasks and subtasks

b. To show which ADP capabilities provide the most support throughout the application area

c. Assuming the more tasks associated with an ADP capability associated with the greater the need for its development, it can be used as a basis for determining a schedule for development.

Chart 3. ADP Capabilities vs Tasks

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing				Image Processing					Computer Assisted Training				Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition	Special Processes	Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local	Data Base Conversion	Microfilm	Interactive Online	Batch	
a. Analysis and recommendation of optimum use for each of 7 resources:																					
1. Retrieve data on URA capability and potential, social and economic needs, interagency commitments		X			X		X												X		Textual retrieval includes information from impact studies as well as URA narratives
2. Analyze each resource for optimum use based on interaction of above data									X										X		Based on user-defined parameters defining optimum use factors and limiting factors, computer processes can assist in determining optimum use
3. Add optimum use recommendation areas to planning unit base map				X															X		
4. Prepare narrative justification for each resource recommendation area								X											X		
b. Identification, analysis, coordination and recordation of overlaps and conflicts among resource activities																					
1. Compare all activity recommendation areas for conflicts, overlaps					X				X						X				X		Based on user-defined parameters defining what a conflict is, computer processes can quickly extract conflict areas and produce such areas in graphic format for visual or hard copy display. The user-defined parameters could be based on conversational guidance between computer and analyst using an automated version of the Coordination Checklist for Developing Multiple-Use Recommendations
2. Identify all needed coordination or multiple use decisions to resolve conflicts or overlaps				X		X			X										X		
3. Modify activity recommendation plans into multiple use plans based on reconciled conflict and overlap					X		X		X										X		
4. Verify consistency of multiple use recommendations				X	X				X										X		
5. Prepare multiple-use recommendation overpays									X										X		
6. Prepare narrative for each multiple-use recommendation																					

Chart 3. ADP Capabilities vs Tasks (Continued)

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
c. Determination and recordation of needed support activities																					
1. Analyze multiple use recommendations for support requirements					X		X												X		
2. Consider adequacy of present support		X	X																X		
3. Prepare overlays to depict location of recommended support efforts				X															X		
4. Prepare narratives justifying each support recommendation								X											X		
d. Determination and recordation of contingency alternatives																					
1. Identification of developments which could affect BLM lands							X													X	References to plans of other agencies and private organizations
2. Prepare overlay depicting multiple use recommendation if development occurs				X															X		
3. Prepare narrative supporting overlay								X											X		
e. Decision on which activity plans to adopt and to what extent																					
1. Reference to District Mgmt profile to determine who to contact and when		X			X		X												X		
2. Modifications as necessary to multiple-use overlays where D.M. modifies				X															X		
3. Narratives prepared as necessary justifying modifications								X											X		
f. Maintenance and periodic revision				X		X													X	X	Choice between interactive or batch depending on urgency of revised documentation

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Chart 4 is a matrix which presents the relationship of the required ADP capabilities described in detail in Section 6.3.1.4.1 and generally in Appendix A to the problems identified in Section 6.3.1.3.2. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are needed to help solve the problems in the application area

b. To show which ADP capabilities provide the most support, i.e., help solve the most problems

c. Assuming the more problems solved by an ADP capability the greater the need, it can be used as the basis for determining a schedule for development.

Chart 4. ADP Capabilities vs Problems

PROBLEMS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Maintenance, deterioration and replacement of overlays				X	X															X	
b. Availability due to increasing use				X	X														X		
c. MFPs are out of date before complete	X		X	X		X	X	X											X	X	
d. Conflict identification using overlays doesn't work					X				X										X	X	
e. Procedures for studying resource relationships too slow					X				X										X	X	
f. Updating MFP is slow and other jobs more important so MFP gets out of date	X			X		X														X	
g. Major narrative effort that takes a lot of time						X		X											X	X	
h. Access to supporting data (EAR/EIS) not adequate		X	X				X												X	X	

6.3.2 Benefits

6.3.2.1 Introduction

The benefits of applying specified ADP capabilities to problems in the current BLM situation can be measured in terms of:

a. MFP products produced more efficiently

b. MFP products and processes not available now

c. MFP processes executed more efficiently.

6.3.2.2 Detailed Benefits

a. The process of determining multiple use recommendations requires extensive use of the overlay technique. If this task is automated, overlay results will be available upon request and the district planner can devote much more of his time to the conflict identification, analysis and judgement process and less to the manual preparation of the overlay.

b. Duplication of any overlay or narrative will be available as needed. This will allow parallel work efforts by any number of planners in separate offices who might need the same overlay.

c. The automated overlaying process is a tool which identifies and displays extremely complex resource relationships as easily as a dual-use area and may prevent overlooking "hidden" conflict areas.

d. Complex multiple use area overlays can be rapidly reproduced at larger scales without detracting from the accuracy to make the district planners visual analysis work easier.

e. The problem of URA overlay deterioration from frequent access-retrieval actions is eliminated. Computer-stored data, in any format, is not subject to deterioration from use.

f. The district planner will be able to easily predict the long-term effect of many tentative multiple-use decision combinations by using automated analytic tools (i.e., determining the demographic effect of canceling all gravel extraction leases in a community). This planning safeguard is not readily available in today's organization.

g. From 20 to 100 narratives required for a complete MFP, once stored, can be immediately retrieved as final or draft copy, with or without modification to reflect changes in the resource condition. They will save the district planner writing and editing time that he can reallocate to analytic and professional judgement efforts. It will also reduce the hours of clerical support required.

h. Using combinations of ADP capabilities, the district planner will have MFP source data accessible within minutes of initiating the request. The planner has the benefit of a temporary visual display that can be reproduced as hard-copy after verifying his need for it.

i. The final MFP task, decision on which activity plans to accept and to what extent, is a matter of the District Manager's judgement based on the best information available. By applying ADP capabilities to MFP tasks as indicated in Chart 3 the final MFP decision is improved:

   1. ADP provides the means of easily keeping source information current. Up-to-date information is mandatory for making up-to-date decisions.

   2. ADP provides the means of easy access to source information. Easy access reduces idle time while waiting for information requests to be processed off-site. This increases the Manager's time for judgemental considerations.

   3. ADP provides the means of storing and displaying more useful source information than is possible to manually store and effectively reference.

On the following pages the products which support the Bureau's MFP tasks are shown to add specifically to the general product

types referred to in the above benefit narratives. Note that all nine benefits are realized for all MFP tasks.

6.3.2.3. Supporting Charts

Chart 5 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.3.1.2 to the anticipated benefits identified in Section 6.3.2.2 and the output products. The matrix is intended to serve four purposes:

a. To provide a list of the generic products associatedwith a task.

b. To show the anticipated benefits associated with a particular task.

c. Assuming that the more anticipated benefits associated with a task the greater the gain to BLM, it can be used as the basis for determining a schedule for implementation

d. To show how widespread a benefit is by presenting the number of application area tasks affected by the benefit.

TASKS	PRODUCTS	BENEFITS										
		a. Less manual effort in overlay preparation	b. Parallel work efforts requiring same overlay made possible	c. Hidden conflict areas made visible	d. Rapid reproduction and scale change of overlays	e. Overlay deterioriation from frequent use eliminated	f. Prediction of long-term effects made easier	g. Manual preparation and maintenance effort reduced	h. Visual verification of information before hardcopy → less paper	Judgment based on best information available made better		
a1. Analysis and recommendation of Lands optimum use	Lands activity recommendation overlay Lands activity recommendation narratives	X	X	X	X	X	X	X	X	X		
a2. Analysis and recommendation of Minerals optimum use	Minerals activity recommendation overlay Minerals activity recommendation narratives	X	X	X	X	X	X	X	X	X		
a3. Analysis and recommendation of Wildlife optimum use	Wildlife activity recommendation overlay Wildlife activity recommendation narratives	X	X	X	X	X	X	X	X	X		
a4. Analysis and recommendation of Recreation optimum use	Recreation activity recommendation overlay Recreation activity recommendation narratives	X	X	X	X	X	X	X	X	X		
a5. Analysis and recommendation of Timber optimum use	Timber activity recommendation overlay Timber activity recommendation narratives	X	X	X	X	X	X	X	X	X		
a6. Analysis and recommendation of Watershed optimum use	Watershed activity recommendation overlay Watershed activity recommendation narratives	X	X	X	X	X	X	X	X	X		
a7. Analysis and recommendation of Forage optimum use	Forage activity recommendation overlay Forage activity recommendation narratives	X	X	X	X	X	X	X	X	X		
b. Identification, analysis, coordination and recordation of overlaps and conflicts among resource activities	Composite overlay of multiple use recommendation areas Optional overlays for complex multiple use activity areas Narratives of multiple use recommendation and supporting analysis for each of the resource activities	X	X	X	X	X	X	X	X	X		

Chart 5. Tasks vs Products and Benefits

TASKS	PRODUCTS	BENEFITS										
		a. Less manual effort in overlay preparation	b. Parallel work efforts requiring same overlay made possible	c. Hidden conflict areas made visible	d. Rapid reproduction and scale change of overlays	e. Overlay deterioration from frequent use eliminated	f. Prediction of long-term effects made easier	g. Manual preparation and maintenance effort reduced	h. Visual verification of information before hardcopy → less paper	Judgment based on best information available made better		
c1. Determination and recordation of needed Cadastral support	Overlay depicting location of needed Cadastral support Narrative justifying needed Cadastral support	X	X	X	X	X	X	X	X	X		
c2. Determination and recordation of needed fire protection and rehabilitation support	Overlay depicting location of needed protection and rehabilitation support Narrative justifying needed protection and rehabilitation support	X	X	X	X	X	X	X	X	X		
c3. Determination and recordation of roads and trails support	Overlay depicting location of needed roads and trails support Narrative justifying needed roads and trails support	X	X	X	X	X	X	X	X	X		
c4. Determination and recordation of needed Buildings and Yards support	Overlay depicting location of needed Buildings and Yards support Narrative justifying needed Buildings and Yards support	X	X	X	X	X	X	X	X	X		
d. Determination and recordation of Contingency Alternatives	Overlays, as necessary, to depict multiple use recommendation areas given developments by other agencies Narrative descriptions describing in detail the contingency	X	X	X	X	X	X	X	X	X		
e. Decision on which activity plans to adopt and to what extent	Narratives as necessary to justify D.M.'s modifications to multiple use recommendations	X	X	X	X	X	X	X	X	X		
f. Maintenance and periodic revision	Up-to-date overlays Up-to-date narratives	X	X	X	X	X	X	X	X	X		

Chart 5. Tasks vs Products and Benefits (Continued)

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Chart 6 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.3.1.2 to the potential BLM users of products generated when the task is automated. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which users

b. To show how many users will receive products from automation of the particular task

c. Assuming that the more anticipated users, the higher the priority for implementation, it can be used as a basis for determining an implementation schedule.

USERS / TASKS	District Manager	Area Manager										
a1. Analysis and recommendation of Lands optimum use		X										
a2. Analysis and recommendation of Minerals optimum use		X										
a3. Analysis and recommendation of Recreation optimum use		X										
a4. Analysis and recommendation of Wildlife optimum use		X										
a5. Analysis and recommendation of Timber optimum use		X										
a6. Analysis and recommendation of Watershed optimum use		X										
a7. Analysis and recommendation of Forage optimum use		X										
b. Identification analysis coordination and recordation of overlaps and conflicts among resource activities		X										
c1. Determination and recordation of needed Cadastral support		X										
c2. Determination and recordation of needed fire protection and rehabilitation support		X										
c3. Determination and recordation of needed roads and trails support		X										
c4. Determination and recordation of needed Buildings and Yards support		X										
d. Determination and recordation of contingency alternatives		X										
e. Multiple use decision on which activity plans to adopt and to what extent	X											
f. Maintenance and periodic revision		X										

Chart 6. Tasks vs User

Chart 7 is a matrix which presents the relationship of the anticipated benefits described in detail in Section 6.3.2.2 to the required ADP capabilities identified specifically in Section 6.3.1.4.1 and generally in Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required by this application area to realize the anticipated benefits

b. To show which ADP capabilities provide the most support in terms of the number of benefits associated with a particular ADP capability

c. Assuming the more anticipated benefits associated with an ADP capability the greater the need for the capability, it can be used as the basis for determining and effectively reference.

On the following pages the products which support the Bureau's MFP tasks are shown to add specificity to the general product types referred to in the above benefit narratives. Note that all nine benefits are realized for all MFP tasks.

Chart 7. Benefits vs ADP Capabilities

BENEFITS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing				Image Processing					Computer Assisted Training				Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition	Special Processes	Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local	Data Base Conversion	Microfilm	Interactive Online	Batch	
a. Less manual effort in overlay preparation				X															X	X	
b. Parallel work efforts requiring same overlay made possible					X														X	X	
c. Hidden conflict areas made visible					X				X										X	X	
d. Rapid reproduction and scale change of overlays					X														X		
e. Overlay deterioration from frequent use eliminated				X	X																
f. Prediction of long term effects made easier		X	X						X										X	X	
g. Manual preparation and maintenance effort reduced				X	X	X	X	X											X	X	
h. Visual verification of information before hard copy → less paper		X	X		X		X												X		
i. Better judgment based on best information available		X	X		X		X												X	X	

6.3.3 Requirements

6.3.3.1 Introduction

In order to implement this application area, certain requirements must be met. These requirements are displayed on the following pages in terms of:

a. Data set requirements

b. Supplier responsibility

c. Input requirements from other application areas.

6.3.3.2 Supporting Charts

Chart 8 is a matrix which presents the data sets described in detail in Table 5-1 and in general in Appendix B that will be used by the application area tasks described in detail in Section 6.3.1.2. The matrix is intended to serve three purposes:

a. To show which data sets are required to execute application area tasks

b. To show how much use is made of a data set by representing the number of tasks within an application area that use the data set.

c. To show how the particular task uses the data in the data set, i.e., just displays the data, (R) adds new data (W) or corrects existing data. (R/W)

The symbols used at the intersections have the following meanings:

R - Indicates that the data in the data set is read, i.e., displayed on a video screen, in a report, etc., but no updating of the data takes place. This is just a visual display of the data for review, auditing, information, etc. For example, the resource specialist would want to examine previous resource surveys in a paticular area before making a field trip. To do this the various resource data sets are interrogated to determine if

a resource survey was performed in the desired area and if so, what information was gathered in each resource category. This could be done initially using a video device and if the information is useful a hard copy could be obtained.

W - Indicates that the data set or a logical record is initially created without immediate review. An audit trail or error listing may be produced as a result of this update but no use is made of the updated data set. For example, a large amount of information may be added to a data set which would involve a time consuming effort to enter, edit and correct each transaction.

R/W - Indicates the data set is:

1. Created or updated and then used to produce a product. That is, the resource specialist enters the field collected data into the data set, makes corrections, if necessary, and the new data is displayed in a report.

2. Read and after some analysis data in the set is updated. For example, the resource specialist, prior to a field trip, could be perusing resource information from a resource area and, because of that specialist's knowledge of the area, fill in missing information.

R/* - Indicates that while reading the data in a data set a conflict with information in a second data set is discovered. No corrective action is taken at this time. For example, if the resource specialist was examining URAs in the secialists discipline and a discrepancy was noted with the previously examined resource inventory data, a field trip would be required before the discrepancy could be corrected.

It should be noted that the symbol used represents the most common usage of a data set by a task. This does not mean however that another function cannot be performed. The common procedure may be to read (R) only, but on occasion a write (W) or conflict reduction (R/*) may be done.

Detailed menus for each data set are found in Phase IV of the report.

Chart 8. Tasks vs Data Sets

TASKS	DATA SETS																					
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	Program Plans	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
a1. Analysis and recommendation of Lands optimum use																		R-1	R			
a2. Analysis and recommendation of Minerals optimum use																		R-1	R			
a3. Analysis and recommendation of Recreation optimum use																		R-1	R			
a4. Analysis and recommendation of Wildlife optimum use																		R-1	R			
a5. Analysis and recommendation of Timber optimum use																		R-1	R			
a6. Analysis and recommendation of Watershed optimum use																		R-1	R			
a7. Analysis and recommendation of Forage optimum use																		R-1	R			
b. Identification, analysis, coordination and recordation of overlaps and conflicts among resource activities										R	R	R										
c1. Determination and recordation of needed Cadastral support										R												
c2. Determination and recordation of needed fire protection and rehabilitation support																		R-1	R	W		
c3. Determination and recordation of needed Roads and Trails support																			R	W		
c4. Determination and recordation of needed Buildings and Yards support																	R		R	W		
																	R		R	W		

Chart 8. Tasks vs Data Sets (Continued)

TASKS	DATA SETS																					
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	Program Plans	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
d. Determination and recordation of contingency alternatives												R						R-1		W		
e. Decision on which activity plans to adopt and to what extent												R								R/W		
f. Maintenance and periodic revision										R	R	R					R	R-1	R	R/W		

NOTE 1: Abstract references to appropriate EARs, EISs and other environmental reports.

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Chart 9 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.3.1.2 to data mairtained in other application areas and BLM personnel responsible for supplying application input data. The matrix is intended to serve three purposes:

a. To show which other application areas furnish information to the application area task

b. To show the personnel position titles within BLM which are responsible for providing information to the application area task

c. It may indicate critical application area linkages, which would affect the implementation sequence.

Chart 9. Tasks vs Application Area Inputs and Supplies Responsibility

TASKS	APPLICATION AREA INPUTS															SUPPLIERS									
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	Protection	Regional Analysis	EAR/EIS	District Lands and Realty Specialist	District Minerals Specialist and Mining Engineers	District Outdoor Recreation Planner	District Wildlife Mgmt Specialist	District Forester	District Natural Resource Specialist	District Range Conservationist	District Manager	Dist. fire control Officer and resource specialists	Dist. engineering techs. & Dist. resource spec.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15										
a1. Analysis and recommendation of Lands optimum use		X												X	X	X									
a2. Analysis and recommendation of Minerals optimum use		X												X	X		X								
a3. Analysis and recommendation of Recreation optimum use		X												X	X			X							
a4. Analysis and recommendation of Wildlife optimum use		X												X	X				X						
a5. Analysis and recommendation of Timber optimum use		X												X	X					X					
a6. Analysis and recommendation of Watershed optimum use		X												X	X						X				
a7. Analysis and recommendation of Forage optimum use		X												X	X							X			
b. Identification, analysis, coordination and recordation of overlaps and conflicts among resource activities														X									X		
c1. Determination and recordation of needed Cadastral support								X								X									

Chart 9. Tasks vs Application Area Inputs and Supplies Responsibility (Continued)

TASKS	APPLICATION AREA INPUTS																SUPPLIERS										
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	Protection	Regional Analysis	EAR/EIS	District Lands and Realty Specialist	District Minerals Specialist and Mining Engineers	District Outdoor Recreation Planner	District Wildlife Mgmt Specialist	District Forester	District Natural Resource Specialist	District Range Conservationist	District Manager	Dist. fire control Officer and resource specialists	Dist. engineering techs. & Dist. resource spec.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15										
c2. Determination and recordation of needed fire protection and rehabilitation support													X											X	
c3. Determination and recordation of needed roads and trails support								X				X													X
c4. Determination and recordation of needed Buildings and Yards support												X													X
d. Determination and recordation of contingency alternatives														X	X	X	X	X	X	X	X	X	X	X	X
e. Decision on which activity plans to use and to what extent			X																			X			
f. Maintenance and periodic revision		X	X					X				X	X	X	X	X	X	X	X	X	X	X	X	X	X

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6.3.4 Application Package Relationships

6.3.4.1 Introduction

The following schematic displays the relationship of the MFP application to application areas which support it and to application areas supported by it. The numbers associated with each arrow are keyed to a narrative in Section 6.16.

6.3.4.2 Relationship Chart

Chart 10 is a graphic presentation of package interrelationships.

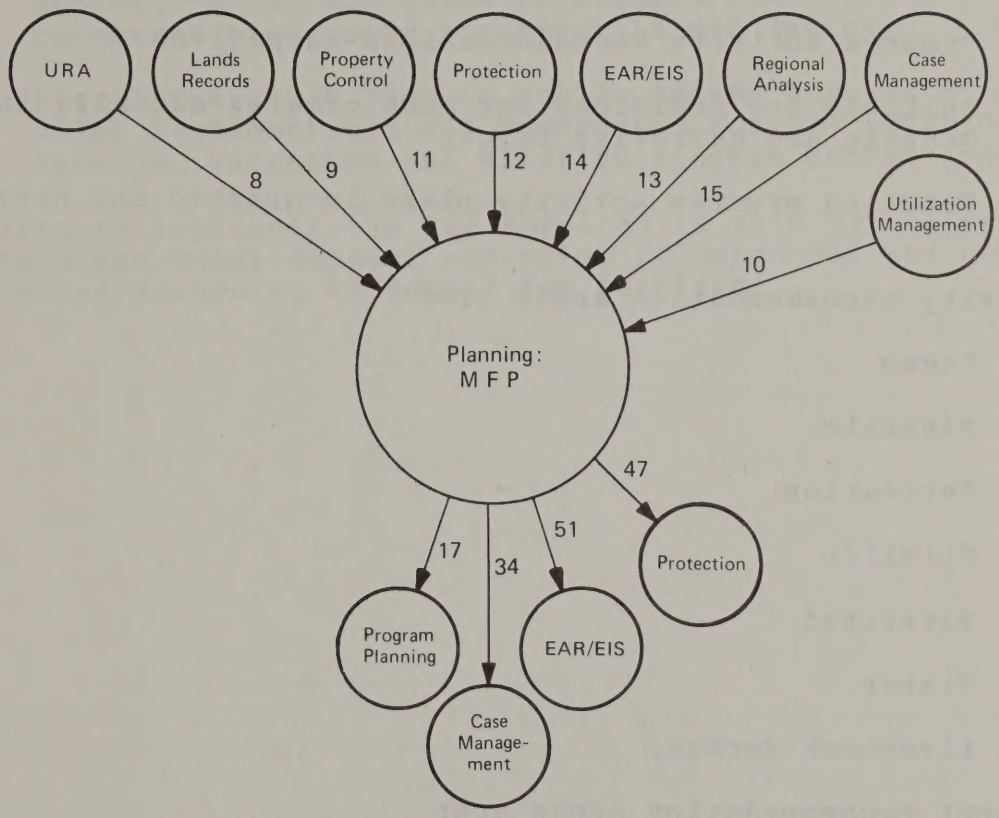

Chart 10. Package Interrelationships

6.3.5 Implementation Options

Should the Bureau decide to implement this package in smaller increments than full support of the MFP, there are some combinations of MFP procedures and activity recommendation areas which can be developed independently of each other without creating repetitive development work and which provide useable BLM products for the MFP function.

MFP procedures are:

a. Program Activity Recommendations-narratives

b. Multiple use decisions for each program actually in graphic and narrative format

c. Detailed program activity plans in graphic and narrative format.

MFP activity recommendation areas are:

a. Lands

b. Minerals

c. Recreation

d. Wildlife

e. Watershed

f. Timber

g. Livestock Forage.

MFP Support recommendation areas are:

a. Cadastral Survey

b. Fire Protection and Rehabilitation

c. Roads and Trails Construction

d. Buildings and Yards Construction and Maintenance

e. General Administration.

One (incomplete) illustration of an MFP implementation plan might be:

a. Fiscal Year 1976-implement Minerals and energy graphics support for multiple-use recommendation phase

b. Fiscal Year 1977-implement the automated narrative capability for all three procedures and support recommendation areas for Minerals and Energy

c. Fiscal Year 1978 (due to public demand forecasted in 1976) implement all MFP procedures for the Livestock Storage, Watershed and Wildlife program activities.

The ability to implement the MFP workload in this way allows the Bureau to phase total support according to personnel and dollar resources and according to demand for services.

6.4 PROGRAM PLANNING

6.4.1 Introduction

6.4.1.1 Objective

The objective of this package is to provide automated support for the processes and products required to produce a cyclical five-year program which will bridge the gap between the Management Framework Plan and the Annual Work Plan.

6.4.1.2 Tasks

The tasks which will benefit from implementation of the package are:

a. Preparation, recordation and maintenance of program activity plan narratives, supporting tables and maps for each resource program:

   1. Minerals
   2. Livestock Forage
   3. Timber
   4. Watershed
   5. Recreation
   6. Wildlife.

b. Preparation, recordation and maintenance of support activity requirements for each of the resource program areas:

   1. Lands and Cadastual
   2. Roads and Trails
   3. Buildings and Yards
   4. Fire Management
   5. Management and Administration.

c. Preparation, recordation and maintenance of auxillary work requirements not covered by program activity plans (i.e., in the range management program, custodial areas have neither the acreage nor value to require an Allotment Management Plan - the name of the program activity plan for the Livestock Forage program):

   1. Issue of leases and licences

   2. Timber sale administration not covered by a program activity plan

   3. Trepass and compliance control not covered by a program activity plan

   4. Employee training

   5. Equal employment opportunity

   6. General staff work.

d. Review and quantification of support activity requirements and auxillary work requirements at various BLM levels:

   1. District

   2. State

   3. Other.

e. Preparation and recordation of quantifiable inputs to the 5-year cyclic programming process from program activity plans (PAPs), support activity requirements (SARs) and auxillary work requirements (AWRs).

f. Maintenance and refinement of planned program actions within the three major levels of the programming cycle:

   1. Three years of Out-Year programming which emphasizes field input to the process

   2. One year of Program-Year programming which emphasizes conflict resolution, negotiation of differences between organizational levels

3. One year of Budget-Year programming which emphasizes funding considerations for Program Year planning decisions.

6.4.1.3 Current Situation

6.4.1.3.1 Description

This application area has never been implemented in the Bureau as described in these tasks. The current programming process utilizes the "issue or special problem" pre-package and package approach. This does not promote an integrated, mission-oriented workload. Furthermore, there has been much concern throughout Bureau levels regarding the inability of the package approach to effectively link the MFP and Annual Work Planning processes.

As a result of this situation, a 5-year programming cycle is being presented to alleviate these problems. The Strategic Plan Study Team supports the concepts of this cyclic approach as a better process for multi-use programming than the package/special problem approach. The problems addressed below pretain to implementing the 5-year cyclical approach if done in today's ADP organization.

6.4.1.3.2 Problems

a. BLM's role in supporting the national economy has grown so large so fast that the Bureau no longer has sufficient lead time to adjust programs to national needs. At present, with changing commodity production/consumption, there is no systematic methodology to view these trends, interpret them and relate them to BLM's role in planning for satisfying future economic needs.

b. Program specialists are required to do considerable estimating and quantifying for each program activity plan. Access to source data required to do this is limited and sometimes non-existant. Quantification becomes guesswork - an exercise which the specialist feels requires too much of his time for the benefit derived.

c. If historical source data (from past resource conditions, programs, and results of past program activity plans) were accessible to the specialist for quantifying input actions (see problem statement b) the required manual filing system, cross-reference system and space required for storage of the data would not be practical.

d. There are several levels of review and consolidation which require access to the data-to-date. While the reviewing official has these documents, one of two situations occurs:

   1. The program specialist who provided the data can do no more work on that area while his documents are in the hands of the reviewer.

   2. The program specialist has duplicates made and can refine his data while the earlier efforts are being reviewed. The reviewer may then be studying out-of-date information.

e. The planning processes envisioned by the 5-year cycle requires coordination of SARs and AWPs from the basic BLM building block, the resource area, to the Bureau-wide SAR and AWR. This coordination is inhibited by:

   1. The postal system as the data communication link between levels

   2. Misinterpretation of data as it is passed from level to level

   3. Loss of data through the various channels of human communication

f. The programming process requires coordination of:

   1. Different amounts of input action execution among the three kinds of management planning (PAPs, SARs and AWRs) for a program

   2. Different amounts of development between resource programs.

This intra- and inter-program development situation is difficult to plan and control manually.

g. Several Budgeting steps require balancing and shifting resource allocations as programs move from out-years to Program Year through Budget Year to Current Year levels. Tracing the effect of these changes on program plans is time-consuming. Furthermore, because of the situation described in problem b, analyzing the effect on programs from changes in manpower, timeframes and dollars becomes guesswork. The planner has little or no timely and factual support to uphold his budget requests.

h. Social, economic, demographic and political considerations are mandatory to the development of a comprehensive PAP and SAR. The Bureau has very limited amounts of this data, no timely access to it and many of the Bureau planners have not been trained in interpretation of social and economic data.

i. During the cost estimating tasks for program out-years, there is a need to correlate present costs versus future costs discounted to the present. Within the current organization, there is insufficient access to automated statistical tools to facilitate this task nor is there adequate access to any economic inputs to determine future costs.

6.4.1.3.3 Supporting Charts

Chart 1 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.4.1.2 to the problems identified in Section 6.4.1.3.2. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which problem areas

b. To show how widespread a problem is by presenting the number of application area tasks affected by that problem

c. Assuming that the more widespread a problem the higher priority for solution, it can be used as the basis for determining a schedule for implementing solutions.

PROBLEMS / TASKS	No systematic way to relate area trends to Bureau planning	Quantification processes in PAPs, SARs and AWRs difficult	Storage requirements for storing historical planning input data not practical	Multiple users at same time	Communications problem for different levels of input and review	Differential program development within a program and between programs	Budget effects on 5-year cycle hard to trace	Social, economic political data hard to get and need to know how to use	Need statistical tools to facilitate cost estimating			
Preparation, recordation and maintenance of program activity plan narratives, supporting tables and maps for each resource program		X	X						X			
Preparation, recordation and maintenance of support activity requirements for each of the resource program areas		X	X						X			
Preparation, recordation and maintenance of auxiliary work requirements		X	X						X			
Review and quantification of support activity requirements and auxiliary work requirements at the various BLM organizational levels		X		X	X				X			
Preparation and recordation of quantifiable inputs to the five-year cyclic programming process from program activity plans, support activity requirements and auxiliary work requirements	X		X			X	X	X	X			
Maintenance and refinement of planned program actions within the three major levels of the programming cycle: out years, program year and budget year	X					X						

Chart 1. Problems vs Tasks

Chart 2 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.4.1.2 to the current BLM ADP support systems. The matrix is intended to show which application area tasks are currently supported in any degree by automation.

TASKS / CURRENT ADP SUPPORT SYSTEMS	WC&AD System	P.D. Inventory	Range Management									
Preparation, recordation and maintenance of program activity plan narratives, supporting tables and maps for each resource program	4c	2b	3b									
Preparation, recordation and maintenance of support activity requirements for each of the resource program areas												
Preparation, recordation and maintenance of auxiliary work requirements not covered by program activity plans												
Review and quantification of support activity requirements and auxiliary work requirements at the various BLM organization levels												
Preparation and recordation of quantifiable inputs to the five-year cyclic programming process from program activity plans support activity requirements and auxiliary work requirements		2b										
Maintenance and refinement of planned program actions within the three major levels of the programming cycle: out years, program year and budget year												

Chart 2. Problems vs Current ADP Support

6.4.1.4 ADP Capabilities

6.4.1.4.1 Description

Implementation of this application area will require use of certain ADP capabilities. Capabilities recommended for five-year programming subtasks are:

a. Predefined structured data retrieval - to support the need for programming input data from various MFP and URA formatted products.

b. Predefined structured data output - to support the generation of various pre-defined Program planning products: PAP data tables, SAR and AWR standardized quantified needs lists.

c. Mapping data entry and/or modification and retrieval - to support the generation and maintenance of graphic display of program activity areas and associated geo-referenced features. (This capability has minor significance in the Program Planning application.)

d. Text processing retrieval - to support the need for Program Planning inputs from various MFP, URA, socio-economic narrative products.

e. Text processing composition - to support the generation of various Program Planning narrative products which justify program support and auxillary needs and resources necessary to meet those needs.

f. Special processes - various mathematical/statistical software programs designed to assist in trend analysis and cost estimating are needed to support predictive accuracy in program planning.

g. Job execution capabilities - the choice between interactive or batch job execution to support any sub-task depends on user need and the immediacy of that need.

6.4.1.4.2 Supporting Charts

Chart 3 is a matrix which presents the relationship of the application area tasks and subtasks described in detail in Section 6.4.1.2 to the required ADP capabilities identified, specifically, in Section 6.4.1.4.1 and, generally Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required to support the application area tasks and subtasks

b. To show which ADP capabilities provide the most support throughout the application area

c. Assuming the more tasks associated with an ADP capability associated with the greater the need for its development, it can be used as a basis for determining a schedule for development.

Chart 3. ADP Capabilities vs Tasks

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing				Image Processing					Computer Assisted Training				Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition	Special Processes	Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local	Data Base Conversion	Microfilm	Interactive Online	Batch	
a. Preparation, recordation and maintenance of program activity plan narratives, supporting tables and detailed maps for each resource program																					
1. Gather existing applicable statistical data about the area		X	X																X	X	Existing data comes from MFPs, URA, resource inventories and intensive field work as necessary
2. Gather existing applicable narrative/ text information about the area							X												X	X	
3. Analyze information to determine what part of which geographic areas require program activity plans																					
4. Determine facilities/projects required within the PAP area and include estimates of costs									X										X	X	Cost prediction routines using historical data from similar projects and inflation factor
5. Record program activity plan narrative								X												X	
6. Record program activity plan tabular data to support narrative as necessary		X																		X	
7. Generate detailed map of each PAP area pinpointing exact location of facilities, projects, etc.				X																X	
8. Update program activity plan narratives during cyclical programming years as necessary						X													X		
9. Update program activity plan statistics during programming cycles as necessary	X																		X		
10. Update program activity plan maps during programming cycles as necessary				X															X		
b. Preparation, recordation and maintenance of support activity requirements																					
1. Analyze MFPs and PAPs to determine support activity requirements		X			X		X												X		

Chart 3. ADP Capabilities vs Tasks (Continued)

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
		Retrieval/ Output																			
	Update	Pre-defined	Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
2. Quantify support activity requirements									X										X	X	Quantification can analyze historical support from similar projects for numbers and cost predictions
3. Record quantified support requirements for each PAP	X																			X	
4. Update support requirements during programming cycle refinement stages as necessary	X																		X	X	
c. Preparation, recordation and maintenance of auxiliary work requirements not covered by program activity plans																					
1. Analyze geographic areas not covered by program activity plans to determine auxiliary work requirements					X														X		
2. Analyze historical programming data to determine auxiliary work requirements									X										X		Look at BLM actions of past years on areas not covered by PAPs to assist in predicting future actions on similar lands
3. Quantify auxiliary work requirements									X										X	X	
4. Record quantified auxiliary work requirements	X																			X	
5. Update auxiliary work requirements during programming cycles refinement stages as necessary	X																		X	X	
d. Review and quantification of support activity requirements for district level inputs																					
1. Review support activity requirements to date		X																	X		
2. Preparation of district support requirements		X																	X	X	
3. Update/add to support activity requirements	X																		X	X	

Chart 3. ADP Capabilities vs Tasks (Continued)

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
Review and quantification of support activity requirements for state level inputs																					
1. Review support activity requirements to date		X																	X		
2. Preparation of state-level support requirements		X																	X	X	
3. Update/add to support activity requirements	X																		X	X	
Review and quantification of support activity requirements for other office inputs																					
1. The sub-tasks and associated ADP capabilities are the same as described above.																					
Review and quantification of auxiliary work requirements for district level inputs																					
1. Review auxiliary work requirements to date		X																	X		
2. Preparation of district auxiliary work requirements		X																	X	X	
3. Update/add to auxiliary work requirements	X																		X	X	
Review and quantification of auxiliary work requirements for state level inputs																					
1. Review auxiliary work requirements to date		X																	X		
2. Preparation of state-level requirements		X																	X	X	
3. Update/add to auxiliary work requirements	X																		X	X	

Chart 3. ADP Capabilities vs Tasks (Continued)

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
Review and quantification of auxiliary work requirements for other office inputs 1. The sub-tasks and associated ADP capabilities are the same as described above																					
e. Preparation and recordation of quantifiable inputs to the 5-year cyclical programming process from PAPs, SARs and AWRs 1. Based on departmental and bureau guidelines determine actions from PAPs, SARs and AWRs for inclusion into 5-year cycle									X										X		Use statistical programs to mathematically analyze the effect of various program mixes
2. Record decisions in formats specified for cycle documentation of programming system	X					X													X	X	
f. Maintenance and refinement of planned program actions within the 3 major levels of the programming cycle	X					X													X	X	

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Chart 4 is a matrix which presents the relationship of the required ADP capabilities described in detail in Section 6.4.1.4.1 and generally in Appendix A to the problems identified in Section 6.4.1.3.2. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are needed to help solve the problems in the application area

b. To show which ADP capabilities provide the most support, i.e., help solve the most problems

c. Assuming the more problems solved by an ADP capability the greater the need, it can be used as the basis for determining a schedule for development.

Chart 4. ADP Capabilities vs Problems

ADP CAPABILITIES / PROBLEMS	Structured Data Handling			Mapping/ Graphics		Text Processing				Image Processing					Computer Assisted Training				Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition	Special Processes	Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local	Data Base Conversion	Microfilm	Interactive Online	Batch	
a. No systematic way to relate area trends to Bureau Planning									X												
b. Quantification processes on PAPS, SARS and ALORS difficult									X												
c. Storage requirements for storing historical planning input data not practical		X	X				X						X								
d. Multiple users at same time																			X		
e. Communication problem for different levels of input and review	X					X													X		
f. Differential program development within a program and between programs									X												
g. Budget effects on 5-year cycle hard to trace									X												
h. Social, economic and political data hard to get and need to know how to use	ADP capabilities cannot alleviate																				
i. Need statistical tools to facilitate cost estimating									X												

TASKS	PRODUCTS	BENEFITS										
		a. Differential program development	b. Shifting resource allocations thru 5-yr cycle	c. Terminals for direct communication	d. Shorter turn-around between review stages	e. Easier update and review	f. Narrative requirements facilitated					
a. Preparation, recordation and maintenance of program activity plan narratives, supporting tables and maps for each resource program	• Maps, tables, narratives, project schedules for applicable PAP. i.e., amp-range, amp wildlife etc.	X		X	X		X					
b. Preparation, recordation and maintenance of support activity requirements for each of the resource program areas	• Maps, tables, narrative describing needed support. i.e., lines to be surveyed, roads and trails required			X	X		X					
c. Preparation, recordation amd maintenance of auxiliary work requirements not covered by program activity plans	• Tables and narrative describing and quantifying required work i.e., grazing license issued, compliance work, L&M public filings etc.			X	X		X					
d. Review and quantification of support activity requirements and auxiliary work requirements at the various BLM organizational levels	• Updated version of tasks 2 and 3			X	X							

Chart 4. ADP Capabilities vs Problems (Continued)

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6.4.2 Benefits

6.4.2.1 Introduction

The benefits of applying specified ADP capabilities to problems in the current situation can be described in terms of:

a. Multiple use planning output products used more effectively.

b. A bridge from the MFP process to the budgetary process is made possible.

6.4.2.2 Detailed Benefits

a. Linear programming capabilities will facilitate analysis of differential program development of any program or combination of programs through one or more levels of management intensity for any geographical entity to determine their inter-related effects over a given period.

b. The programming process requires balancing and shifting resource allocations (manpower, man-months) as programs move from the out years through the program year, budget year to current year levels. Planning managers will have immediate access to statistical tools to assist them in analyzing the effect of any action plans mix.

c. Significant savings in mailing costs and paper usage for management planning documentation can be realized by bringing W.O. into direct data contact using alphanumeric display terminals with the State Offices and eliminating sending many hard copy reproductions of draft plan documenation through the mails.

d. By bringing W.O into direct data communications with the State Offices and providing both levels access to up-to-date planning and programming data, there will be a much shorter turn-around time between various stages of submission and review. This will be especially appreciated towards the end of the Budget Year when deadlines are tight or priority changes in response to national or regional demands are frequent.

e. With automated capability, the district and state offices will be able to easily update the program year and out-year plans to reflect changes as they arise. This will eliminate the need to do the programming effort on a crash basis during a very short time period. Under this type of climate, there is more time for program entries to be better thought out and more accurate. Also, review by the state and Washington offices could be done periodically as needed instead of on a crash basis. This leads to better reviews and decisions.

f. All of the benefits realized from applying ADP capabilities to narrative requirements in URA and MFP, also will be realized in the Program planning application:

   1. Timely retrieval and display of narrative documentation in draft and/or final format.

   2. Savings in time for writing and editing.

   3. Reduction in hours of required clerical support.

6.4.2.3 Supporting Charts

Chart 5 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.4.1.2 to the anticipated benefits identified in Section 6.4.2.2 and the output products. The matrix is intended to serve four purposes:

a. To provide a list of the generic products associated with a task.

b. To show the anticipated benefits associated with a particular task.

c. Assuming that the more anticipated benefits associated with a task the greater the gain to BLM, it can be used as the basis for determining a schedule for implementation

d. To show how widespread a benefit is by presenting the number of application area tasks affected by the benefit.

TASKS	PRODUCTS	BENEFITS										
		a. Differential program development	b. Shifting resource allocations thru 5-yr cycle	c. Terminals for direct communication	d. Shorter turn-around between review stages	e. Easier update and review	f. Narrative requirements facilitated					
e. Preparation and recordation of quantifiable inputs to the five year cyclic programming process from program activity plans, support activity requirements and auxiliary work requirements	• Program document (tables, schedules, narrative) reflecting BLM's budgetary needs for 5 yrs	X	X	X	X	X	X					
f. Maintenance and refinement of planned program, actions within the three major levels of the programming cycle: out years, program year and budget year	• Updated program document		X	X	X	X						

Chart 5. Tasks vs Products and Benefits

Chart 6 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.4.1.2 to the potential BLM users of products generated when the task is automated. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which users

b. To show how many users will receive products from automation of the particular task

c. Assuming that the more anticipated users, the higher the priority for implementation, it can be used as a basis for determining an implementation schedule.

USERS / TASKS	Resource Area	District	State Office	DSC/BIFC/Spec. Off.	W.O.							
a. Preparation, recordation and maintenance of program activity plan narratives, supporting tables and maps for each resource program	X	X										
b. Preparation, recordation and maintenance of support activity requirements for each of the resource program areas	X	X										
c. Preparation, recordation and maintenance of auxiliary work requirements not covered by program activity plans		X	X	X	X							
d. Review and quantification of support activity requirements and auxiliary work requirements at the various BLM organizational levels		X	X	X	X							
e. Preparation and recordation of quantifiable inputs to the five-year cyclic programming process from program activity plans, support activity requirements and auxiliary work requirements	X	X	X	X	X							
f. Maintenance and refinement of planned program actions within the three major levels of the programming cycle: out years, program year and budget year.	X	X	X	X	X							

Chart 6. Tasks vs User

Chart 7 is a matrix which presents the relationship of the anticipated benefits described in detail in Section 6.4.2.2 to the required ADP capabilities identified specifically in Section 6.4.1.4.1 and generally in Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required by this application area to realize the anticipated benefits

b. To show which ADP capabilities provide the most support in terms of the number of benefits associated with a particular ADP capability

c. Assuming the more anticipated benefits associated with an ADP capability the greater the need for the capability, it can be used as the basis for determining a development schedule.

Chart 7. Benefits vs ADP Capabilities

BENEFITS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Differential program development									X												
b. Shifting resource allocations thru 5-yr cycle									X												
c. Terminals for direct communication		X	X		X		X												X		
d. Shorter turn-around between review stages																			X		
e. Easier update and review	X					X													X		
f. Narrative requirements facilitated						X	X	X													

Chart 8 is a matrix which presents the data sets described in detail in Table 5-1 and in general in Appendix B that will be used by the application area tasks described in detail in Section 6.4.1.2. The matrix is intended to serve three purposes:

a. To show which data sets are required to execute application area tasks

b. To show how much use is made of a data set by representing the number of tasks within an application area that use the data set.

c. To show how the particular task uses the data in the data set, i.e., just displays the data, (R) adds new data (W) or corrects existing data. (R/W)

The symbols used at the intersections have the following meanings:

R - Indicates that the data in the data set is read, i.e., displayed on a video screen, in a report, etc., but no updating of the data takes place. This is just a visual display of the data for review, auditing, information, etc. For example, the resource specialist would want to examine previous resource surveys in a paticular area before making a field trip. To do this the various resource data sets are interrogated to determine if a resource survey was performed in the desired area and if so, what information was gathered in each resource category. This could be done initially using a video device and if the information is useful a hard copy could be obtained.

W - Indicates that the data set or a logical record is initially created without immediate review. An audit trail or error listing may be produced as a result of this update but no use is made of the updated data set. For example, a large amount of information may be added to a data set which would involve a time consuming effort to enter, edit and correct each transaction.

R/W - Indicates the data set is:

1. Created or updated and then used to produce a product. That is, the resource specialist enters the field collected data into the data set, makes corrections, if necessary, and the new data is displayed in a report.

2. Read and after some analysis data in the set is updated. For example, the resource specialist, prior to a field trip, could be perusing resource information from a resource area and, because of that specialist's knowledge of the area, fill in missing information.

R/* - Indicates that while reading the data in a data set a conflict with information in a second data set is discovered. No corrective action is taken at this time. For example, if the resource specialist was examining URAs in the secialists discipline and a discrepancy was noted with the previously examined resource inventory data, a field trip would be required before the discrepancy could be corrected.

It should be noted that the symbol used represents the most common usage of a data set by a task. This does not mean however that another function cannot be performed. The common procedure may be to read (R) only, but on occasion a write (W) or conflict reduction (R/*) may be done.

Detailed menus for each data set are found in Phase IV of the report.

Chart 8. Tasks vs Data Sets

TASKS	DATA SETS																					
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	Program Plans	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
a. Preparation, recordation and maintenance of program activity plan narratives, supporting tables and maps for each resource program												R							R	R	R/W	
b. Preparation, recordation and maintenance of support activity requirements for each of the resource program areas										R		R			R		R			R	R/W	
c. Preparation, recordation and maintenance of auxiliary work requirements not covered by program activity plans													R		R						R/W	
d. Review and quantification of support activity requirements and auxiliary work requirements at the various BLM organizational levels										R		R	R		R		R			R	R/W	
e. Preparation and recordation of quantifiable inputs to the five-year cyclic programming process from program activity plans, support activity requirements and auxiliary work requirements																					R/W	R/W
f. Maintenance and refinement of planned program actions within the three major levels of the programming cycle: out years, program year and budget year																					R/W	R/W

if additional field work is necessary input to preparation of program activity plans, R/W operations could be performed on any/all of these resource inventory data sets.

Chart 9 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.4.1.2 to data maintained in other application areas and BLM personnel responsible for supplying application input data. The matrix is intended to serve three purposes:

a. To show which other application areas furnish information to the application area task

b. To show the personnel position titles within BLM which are responsible for providing information to the application area task

c. It may indicate critical application area linkages, which would affect the implementation sequence.

Chart 9. Tasks vs Application Area Inputs and Supplier Responsibility

TASKS	APPLICATION AREA INPUTS															SUPPLIERS						
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	EAR/EIS	Regional Analysis	Protection	Area & Dist. Resource Specialists	Dist. Eng., F.C.D., Minerals Spec., Lands Spec.	A.M., D.M., L&M Specs., Ch. Admin., Ch. Res., Ch. Tech. Serv., Spec. Off. Staffs	S.O. Tech. Ser. Staff, Res. Staff, Admin. Staff, Plan. Coord. Staff, W.O. Tech. & Res. Staffs, Div. Budget	Area Res. Spec., Dist. Staff, S.O. Staffs Spec. Off. Staffs, W.O. Staffs		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15							
1. Preparation, recordation and maintenance of program activity plan narratives, supporting tables and maps for each resource program		X	X							X				X		X						
2. Preparation, recordation and maintenance of support activity requirements for each of the resource program areas								X	X		X	X		X	X		X					
3. Preparation, recordation and maintenance of auxiliary work requirements not covered by program activity plans						X			X		X							X				
4. Review and quantitication of support activity requirements and auxiliary work requirements not covered by program activity plans						X		X	X		X	X			X				X			
5. Preparation and recordation of quantifiable inputs to the five-year cyclic programming process from program activity plans, support activity requirements and auxillary work requirements					X	X								X						X		
6. Maintenance and refinement of planned program actions within the three major levels of the programming cycle: out years, program year and budget year.		X	X		X	X		X	X	X	X	X		X	X					X		

6.4.3 Requirements

6.4.3.1 Introduction

To realize the benefits outlined in the previous section, the application package will need the support described in the following charts.

6.4.3.2 Supporting Charts

6.4.4 Application Package Relationships

6.4.4.1 Introduction

The following schematic displays the relationship of the Program Planning application to application areas which provide support to it and application areas which are supported by Program Planning.

6.4.4.2 Relationship Chart

The identifiers in Chart 10 associated with each arrow are keyed to a narrative, which describes the relationship displayed in Section 6.16 of the Long-Range Strategic Plan.

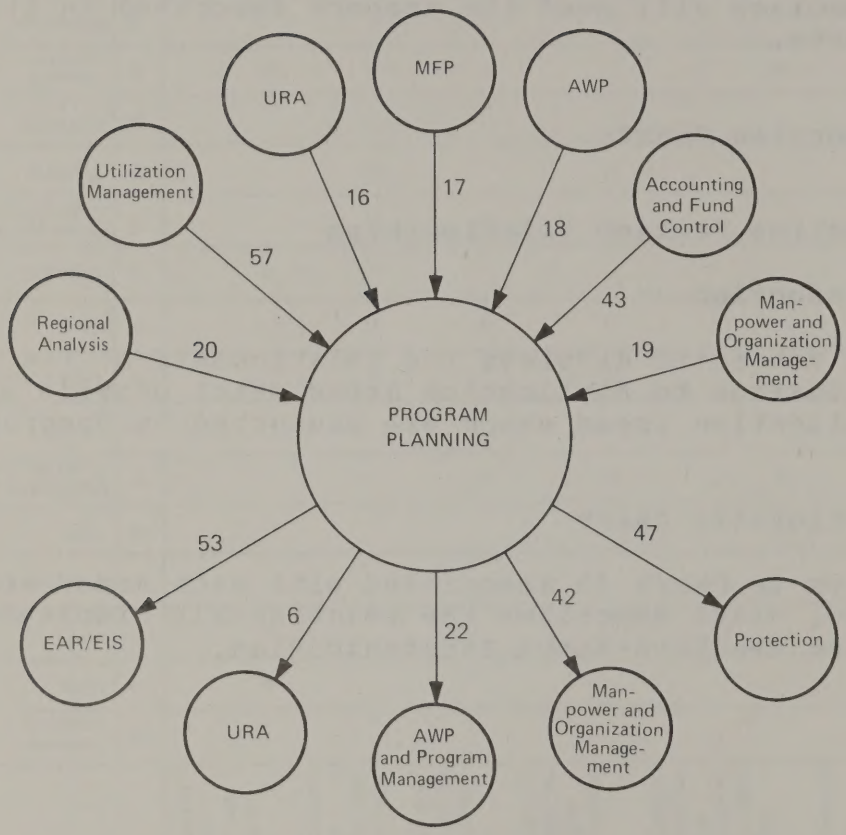

Chart 10. Package Interrelationships

6.4.5 Implementation Options

There is no practical opportunity to break the package implementation down below the package level.

Section 6.5 ANNUAL WORK PLANNING AND PROGRAM MANAGEMENT

6.5.1 Introduction

6.5.1.1 Objective

The objective of this application area is to enhance the automated support for the products and processes required to accomplish AWP planning and program management.

6.5.1.2 Tasks

The tasks that will benefit from implementation of this package are:

a. Preparation, recordation and distribution of annual work plan advices

b. Preparation, recordation and submission of preliminary annual work plans based on the Department's planning allowance to BLM.

c. Preparation, recordation and distribution of annual work plan activities based on approved funds allotted to the Bureau

d. Preparation, recordation and submission of annual work plans to the Washington Office

e. Annual work plan approval and establishment of operating budget

f. Maintenance of the operating budget and program monitoring.

6.5.1.3 Current Situation

6.5.1.3.1 Description

The methodology for performing this task is set forth in BLM's Manuel Management Program entitled Budgeting, 1620 Group, and Annual Work Plan, 1630 group

6.5.1.3.2 Problem Areas

The current BLM situation involves problems with data and processes in both the establishment of the annual work plan and management of these programs through the fiscal year.

a. The development of the Annual Work Plan requires much interaction between the Bureau's organizational levels. The turn-around time between various stages of submission and review is slow enough to inhibit timely managerial analysis of budget changes and their effects on detailed fiscal work plans.

b. The current Annual Work Planning process is not responsive:

   1. It is not easily revised

   2. It is not responsive to the program manager's need for justifying funds and manpower.

c. Access to up-to-date operating budget data is difficult for all offices outside the Service Center. This inhibits use of the operating budget system as a management device and the flexibility intended from its use is lost.

d. The annual work planning process requires many levels of review, consolidation and feedback. The coordination required to do this is not being adequately supported. A means of coordinating among organizational levels on an as-needed basis is required so that the formal review does not uncover major ADP errors and misunderstandings that cannot be adequately corrected within deadlines.

e. Initial annual work plan documentation, corrected documentation as requests are refined through the Various Bureau levels and revisions after the Plan is approved, require duplicate and triplicate copies of various forms mailed to the next organizational level.

This means of communication is too slow to meet the planning deadline requirements and is not reliable:

1. Postal Service mail gets lost or misdirected although it is not a major problem.

2. Postal Service mail has irregular delivery rates - from 2 to 8 days.

3. Internal BLM mail distribution using the "in-basket" technique promotes information loss and misplacement.

f. There is no way to correlate program objectives with funds spent to achieve the objectives (i.e., tree planting to increase timber production.) This correlation is necessary to determine and monitor program investment payoff cycles. The problem is compounded by the fact that each program area has a unique payoff cycle.

g. Program Project status data relating to accomplishment of program input actions (i.e., status of on-going cadastral surveys) is needed for reports to the Director as well as congressional inquiries. About 5 to 6 congressional queries occur per month requiring 16 to 40 man hours of BLM staff time. Congressional queries such as "How much land was surveyed in my district this year?" are not easily handled because the data is not available by Congressional District.

h. At present, no systematic way of presenting summary program management reports to top management and other agencies exists. The present approach results in manual data gathering, manual analysis of computer printouts, hand drafting of charts, tables and graphs and wait-time while compute programs are written and debugged. Present manual file searches and personal communications to accumulate data inhibit any trend to develop systematic summary reporting.

i. Issue-oriented spending information is not available without spending days manually compiling various data from existing financial reports while the information is usually needed within hours.

6.5.1.3.3 Supporting Charts

Chart 1 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.5.1.2 to the problems identified in Section 6.5.1.3.2. The matrix is intended to serve three purposes:

PROBLEMS / TASKS	a. Organizational Interaction	b. Not responsive	c. Poor access to operating budget data	d. Multi-level review and feedback	e. Multiple copies required	f. No way to correlate program objectives to funds spent	g. Data not available for ad hoc queries	h. No summary reports to management	i. Issue oriented data not readily available			
a. AWP Advices	X				X	X						
b. AWP Planning Allowance	X					X			X			
c. AWP based on approved funds	X	X		X	X	X			X			
d. AWP Prep., record, and submission	X	X			X	X			X			
e. AWP approval	X	X		X	X	X		X	X			
f. Operating budget maintenance and program monitoring	X	X	X	X		X	X	X	X			

Chart 1. Problems vs Tasks

a. To show which application area tasks are associated with which problem areas

b. To show how widespread a problem is by presenting the number of application area tasks affected by that problem

c. Assuming that the more widespread a problem the higher priority for solution, it can be used as the basis for determining a schedule for implementing solutions.

Chart 2 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.5.1.2 to the current BLM ADP support systems. The matrix is intended to show which application area tasks are currently supported in any degree by automation.

CURRENT ADP SUPPORT / TASKS	JDR	FM										
a. AWP Advices												
b. PAWP Planning Allowance												
c. AWP based on approved funds												
d. AWP Preparation, recordation, and submission	X	X										
e. AWP Approval												
f. Operating budget maintenance, and monitoring		X										

Chart 2. Problems vs Current ADP Support

6.5.1.4 ADP Capabilities

6.5.1.4.1 Description

Full automation of this application area will require the use of the ADP capabilities described below.

Structured Data Handling Update: Will provide efficient means of initializing and modifying the many statistical tables and reports which are outputs of annual work planning and program management processes. Modification can be done as required rather than batched for once-a-month processing.

Structured Retrieval/Output: Assuming an integrated, well-organized data base and data base management system has been implemented, this capability provides most of all automated support needed in this application. It is the tool which is used to seaach and display all current-year program status data required by the program manager.

Text Processing (Composition, Update, Retrieval): Will support the various AWP and program management narrative requirements in these ways:

- o efficient editing of draft narrative text with minimal or no paper waste
- o fast access to citations, abstracts, full texts to support URA tasks requiring historical or research information
- o alleviate much of the manual clerical support required in producing a URA.

Special Processing: Will provide mathematical analyses of current program status carried to fiscal year-end.

Computer Assisted Training: Will provide the program analyst ready access to instructions on how to use automated mathematical techniques, how to input requirements as parameters and how to operate hardware and software to produce information/product.

6.5.1.4.2 Supporting Charts

Chart 3 is a matrix which presents the relationship of the application area tasks and subtasks described in detail in Section 6.5.1.2 to the required ADP capabilities identified, specifically, in Section 6.5.1.4.1 and, generally Appendix A. The matrix is intended to serve three purposes:

Chart 3. ADP Capabilities vs Tasks

ADP CAPABILITIES / TASKS	Structured Data Handling			Mapping/ Graphics		Text Processing				Image Processing					Computer Assisted Training				Job Execution		Comments
		Retrieval/ Output																			
	Update	Pre-defined	Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition	Special Processes	Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local	Data Base Conversion	Microfilm	Interactive Online	Batch	
a. AWP advices:																					
1. Preparation							X								X				X		
2. Recordation	X																		X		
3. Distribution		X																	X		
b. Preliminary AWP based on planning allowance:																					
1. Preparation									X										X		
2. Recordation	X																		X		
3. Distribution		X																	X		
c. AWP based on approved funds:																					
1. Preparation									X										X		
2. Recordation	X																		X		
3. Distribution		X																	X		
d. AWP:																					
1. Preparation									X										X		
2. Recordation	X																		X		
3. Submission		X																	X		
e. AWP:																					
1. Approval	X																		X		
2. Establishment of operating budget	X																		X		
f. Operating budget:																					
1. Maintenance	X																X		X		
2. Program monitoring		X																	X		

a. To show which ADP capabilities are required to support the application area tasks and subtasks

b. To show which ADP capabilities provide the most support throughout the application area

c. Assuming the more tasks associated with an ADP capability associated with the greater the need for its development, it can be used as a basis for determining a schedule for development.

Chart 4 is a matrix which presents the relationship of the required ADP capabilities described in detail in Section 6.5.1.4.1 and generally in Appendix A to the problems identified in Section 6.5.1.3.2. The matrix is intended to serve three purposes:

Chart 4. ADP Capabilities vs Problems

ADP CAPABILITIES / PROBLEMS	Structured Data Handling			Mapping/ Graphics		Text Processing				Image Processing					Computer Assisted Training				Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition	Special Processes	Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local	Data Base Conversion	Microfilm	Interactive Online	Batch	
a. Organizational interaction		X	X																X		
b. Not responsive		X	X																X		
c. Poor access to operating budget data		X	X																X		
d. Multilevel review and feedback		X	X																X		
e. Multiple copies required		X	X																X		
f. No way to correlate program objectives to funds spent		X							X										X		
g. Data not available for ad hoc queries			X																X		
h. No summary reports to management		X	X				X												X		
i. Issue oriented data not readily available		X																	X		

a. To show which ADP capabilities are needed to help solve the problems in the application area

b. To show which ADP capabilities provide the most support, i.e., help solve the most problems

c. Assuming the more problems solved by an ADP capability the greater the need, it can be used as the basis for determining a schedule for development.

6.5.2 Benefits

6.5.2.1 Introduction

The benefits of applying specified ADP capabilities to problems in the current BLM situation can be described in terms of:

a. Better communication
b. Decreased AWP preparation time
c. Less postage costs
d. Paperwork savings
e. Faster access to needed information
f. Provide hard copy where needed for Operating Budget reconciliation.

6.5.2.2 Detailed Benefits

a. ADP capabilities providing direct communication between each site and its annual work plan source data will decrease preparation time of the Plan and AWP Alterations by at least one week (given a minimum of one week turnaround for sites requesting information from automated systems in today's situation).

b. By bringing the various hierarchical levels of BLM into direct ADP data communication with each other and providing common ADP access to current AWP information, there will be much shorter turn-around time between various stages of AWP submission and review. Direct data communication also eliminates the problems involved using the mails for communicating.

c. Significant savings in mailing costs and paper usage for AWP, operating budget and program management outputs will be realized by providing ADP capabilities for common, conversational access to up-to-date AWP data.

d. Since progress, completion, correction and abandonment reporting against the operating budget will be done directly between each office and the computer, a significant paper work and editing workload will be eliminated at the Service Center. The same ADP capabilities which decrease this workload also provide an effective means of keeping the Annual Work Plan up-to-date and readily available for reference and special reports.

e. Access to operating budget information including hard copy may be obtained within minutes. Given up-to-date data in the operating budget (see Benefit 4), the Operating Budget may be used as an effective management tool.

f. Statistical planning information and progress reporting on an ADP ad-hoc basis will allow the user to see just the information he needs without having to sift through unrequested data.

g. Integrated data bases manipulated by ADP capabilities will provide the necessary support for correlating program data, expenditure data and resource condition data to determine and monitor program investment payoff cycles and issue-oriented spending information requests.

6.5.2.3 Supporting Charts

Chart 5 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.5.1.2 to the anticipated benefits identified in Section 6.5.2.2 and the output products. The matrix is intended to serve four purposes:

TASKS	PRODUCTS	BENEFITS										
		a. Decreased preparation time	b. Shorter turnaround for submission and review	c. Savings in mail costs and unwanted paper	d. Less DSC workload and more up-to-date AWP	e. Operating budget becomes effective management tool	f. Ad hoc statistical reports made possible	g. Interaction between acctg and all use authorization collections				
a. Preparation, recordation, and distribution of AWP Advices		X	X	X								
b. Preparation, recordation, and submission of preliminary annual work plans	• completed annual work plan form • capitalized equipment needs list • a marked Table of Organization printout • Construction Project listing • narrative explanation of each AWP program	X	X	X			X					
c. Preparation, recordation, and distribution of annual work plan directives (based on approved funds)		X	X	X								
d. Preparation, recordation and submission of annual work plans to Washington office	• corrected AWP forms • corrected equipment needs list • corrected Table of Organization proposal • corrected Construction Projects listing • revised narrative explanations of AWP programs	X	X	X			X					
e. Annual work plan approval and establishment of the Operating Budget	• operating budget report		X	X	X							
f. Maintenance of the Operating Budget and monitoring the fiscal year programs	• maintenance schedule • progress reports for activity groupings • program reports on an ad hoc basis			X	X	X	X	X				

Chart 5. Tasks vs Products and Benefits

a. To provide a list of the generic products associated with a task.

b. To show the anticipated benefits associated with a particular task.

c. Assuming that the more anticipated benefits associated with a task the greater the gain to BLM, it can be used as the basis for determining a schedule for implementation

d. To show how widespread a benefit is by presenting the number of application area tasks affected by the benefit.

Chart 6 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.5.1.2 to the potential BLM users of products generated when the task is automated. The matrix is intended to serve three purposes:

USERS / TASKS	Area manager and staff	District manager and staff	State director and staff	W. O. staff	Special offices staff							
a. AWP Advices												
Preparation				X								
Recordation				X								
Distribution				X								
b. PAWP - Planning Allowance												
Preparation	X	X	X	X	X							
Recordation	X	X	X	X	X							
Distribution	X	X	X	X	X							
c. AWP - Approved Funds	X	X	X	X	X							
d. AWP - Preparation, recordation, and submission	X	X	X	X	X							
e. AWP Approval			X	X								
f. Operating Budget	X	X	X	X	X							

Chart 6. Tasks vs Users

a. To show which application area tasks are associated with which users

b. To show how many users will receive products from automation of the particular task

c. Assuming that the more anticipated users, the higher the priority for implementation, it can be used as a basis for determining an implementation schedule.

Chart 7 is a matrix which presents the relationship of the anticipated benefits described in detail in Section 6.5.2.2 to the required ADP capabilities identified specifically in Section 6.5.1.4.1 and generally in Appendix A. The matrix is intended to serve three purposes:

Chart 7. Benefits vs ADP Capabilities

BENEFITS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Decreased preparation time	X					X		X											X	X	
b. Shorter turnaround for submission and review		X					X												X	X	
c. Savings in mail costs and unwanted paper		X					X												X	X	
d. Less DSC workload and more up-to-date AWP	X	X				X	X	X											X	X	
e. Operating budget becomes effective management tool		X					X												X	X	
f. Ad hoc statistical reports made possible			X																X		
g. Interaction between accounting and all the use authorization collections	X	X																	X		

a. To show which ADP capabilities are required by this application area to realize the anticipated benefits

b. To show which ADP capabilities provide the most support in terms of the number of benefits associated with a particular ADP capability

c. Assuming the more anticipated benefits associated with an ADP capability the greater the need for the capability, it can be used as the basis for determining a development schedule.

6.5.3 Requirements

6.5.3.1 Introduction

In order to implement this application area certain requirements must be met. These requirements are displayed on the following charts.

6.5.3.2 Supporting Charts

Chart 8 is a matrix which presents the data sets described in detail in Table 5-1 and in general in Appendix B that will be used by the application area tasks described in detail in Section 6.5.1.2. The matrix is intended to serve three purposes:

Chart 8. Tasks vs Data Sets

TASKS	DATA SETS																					
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	Program Plans	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
a. Preparation, recordation, and distribution of AWP devices																					R	R
b. Preparation, recordation, and submission of preliminary annual work plans															R		R				R/W	R
c. Preparation, recordation, and distribution of annual work plan directives (based on approved funds)																					R	R
d. Preparation, recordation, and submission of annual work plans to Washington Office																					R/W	R
e. Annual work plan approval and establishment of the Operating Budget													W		R		R				R/W	R
f. Maintenance of the Operating Budget and monitoring the fiscal year programs													R/W		R		R/W				R/W	R

a. To show which data sets are required to execute application area tasks

b. To show how much use is made of a data set by representing the number of tasks within an application area that use the data set.

c. To show how the particular task uses the data in the data set, i.e., just displays the data, (R) adds new data (W) or corrects existing data. (R/W)

The symbols used at the intersections have the following meanings:

R - Indicates that the data in the data set is read, i.e., displayed on a video screen, in a report, etc., but no updating of the data takes place. This is just a visual display of the data for review, auditing, information, etc. For example, the resource specialist would want to examine previous resource surveys in a paticular area before making a field trip. To do this the various resource data sets are interrogated to determine if a resource survey was performed in the desired area and if so, what information was gathered in each resource category. This could be done initially using a video device and if the information is useful a hard copy could be obtained.

W - Indicates that the data set or a logical record is initially created without immediate review. An audit trail or error listing may be produced as a result of this update but no use is made of the updated data set. For example, a large amount of information may be added to a data set which would involve a time consuming effort to enter, edit and correct each transaction.

R/W - Indicates the data set is:

1. Created or updated and then used to produce a product. That is, the resource specialist enters the field collected data into the data set, makes corrections, if necessary, and the new data is displayed in a report.

2. Read and after some analysis data in the set is updated. For example, the resource specialist, prior to a field trip, could be perusing resource information from a resource area and, because of that specialist's knowledge of the area, fill in missing information.

R/* - Indicates that while reading the data in a data set a conflict with information in a second data set is discovered. No corrective action is taken at this time. For example, if the resource specialist was examining URAs in the secialists discipline and a discrepancy was noted with the previously examined resource inventory data, a field trip would be required before the discrepancy could be corrected.

It should be noted that the symbol used represents the most common usage of a data set by a task. This does not mean however that another function cannot be performed. The common procedure may be to read (R) only, but on occasion a write (W) or conflict reduction (R/*) may be done.

Detailed menus for each data set are found in Phase IV of the report.

Chart 9 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.5.1.2 to data maintained in other application areas and BLM personnel responsible for supplying application input data. The matrix is intended to serve three purposes:

Chart 9. Tasks vs Application Area Inputs and Supplier Responsibility

TASKS	APPLICATION AREA INPUTS															SUPPLIERS							
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case Management	Utilization	Manpower & Organization	Property	Protection	Regional Analysis	EAR/EIS	Bureau director	Site manager	Director and staff	Service Center staff (potential suppliers are all site managers)				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15								
a. Preparation, recordation, and distribution of AWP advices				X												X							
b. Preparation, recordation, and submission of preliminary annual work plans				X	X						X	X					X						
c. Preparation, recordation and distribution of annual work plan directives (based on approved funds)				X	X											X							
d. Preparation, recordation, and submission of annual work plans to Washington Office				X	X						X	X					X						
e. Annual work plan approval and establishment of the Operating Budget					X	X					X	X						X					
f. Maintenance of the Operating Budget and monitoring the fiscal year programs					X	X					X	X	X						X				

a. To show which other application areas furnish information to the application area task

b. To show the personnel position titles within BLM which are responsible for providing information to the application area task

c. It may indicate critical application area linkages, which would affect the implementation sequence.

6.5.4 Application Package Relationships

6.5.4.1 Introduction

The following schematic displays the relationship of the Annual Work Plan and Program Management Application to application areas which support it and applications which benefit from the AWP and Management application.

6.5.4.2 Relationship Chart

Chart 10 is a graphic presentation of application package interrelationships. The connecting lines and arrows show the flow of the information and the number associated with the line refers to an explanatory paragraph in Section 6.16.

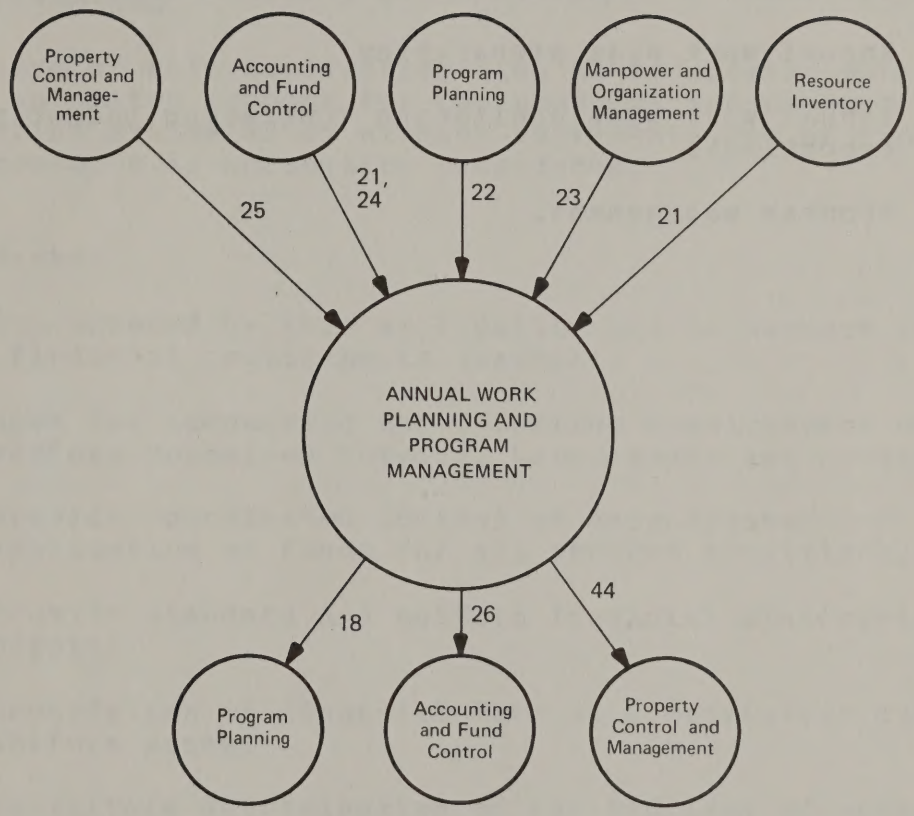

Chart 10. Package Interrelationships.

6.5.5 Implementation Options

This package could be implemented on a phased basis of:

a. Annual work plan preparation

b. Annual work plan monitoring (operating budget progress reporting).

c. Program management.

Section 6.6 FINANCIAL MANAGEMENT: ACCOUNTING AND FUND CONTROL

6.6.1 Introduction

6.6.1.1 Objective

The objective of this application area is to provide more effective automated support for the products and processes in the BLM accounting system which already represents one of the most advanced concepts in accounting procedures.

6.6.1.2 Tasks

The benefits offered by this application are to support the following financial requirements (tasks):

a. Meet the accounting and reporting requirements of various concerned Bureaus, Departments and Congress

b. Provide coordinated control of expenditures and application of funds for all program activities.

c. Provide standard and uniform financial statements and reports

d. Recordation of financial data in a consistent and uniform manner

e. Facilitate determination of the fidelity of persons administering public funds and properties.

6.6.1.3 Current Situation

6.6.1.3.1 Description

The methodology for performing these tasks is set forth in BLM's Manual Procedures, 1300 group.

6.6.1.3.2 Problem Areas

There are few problems with the Bureau's financial system today. ADP currently provides adequate support for:

a. Standard, recurring reporting requirements and financial statements to Congress and the DOI.

b. Recordation of financial data in a consistent manner.

The problems that do exist which are ADP-solvable are due to BIM's batch-oriented data processing system and no capability for direct communication between sites and financial data. Note that by applying ADP capabilities to the few problems indicated below, many "side" benefits are accrued (see subsection 6.6.2).

a. A significant amount of manual effort on the part of Washington Office Staff and necessary field office disruptions is necessary to get data for information requests from DOI, OMB and Congress.

b. Very little statistical financial predicting and long-term trend analysis is done now. It is too time-consuming, requires too much inaccessible source data and is prone to arithmetic error when done on a manual basis.

c. Randomly required summary reports for upper levels of management require sifting through various standard reports (that may or may not be adequately current) to manually extract and compile the requested information.

d. A frequent problem is the misinterpretation or loss of financial information due to the indirect transmission of information from source to user (by letter, telephone call, etc.).

e. Because financial data is inaccessible, exception reporting (a technique to point out conditions outside some predefined level of acceptability) is not the useful timely technique that it was designed to be.

f. The current financial forecasting method of relying on prior year actuals doesn't account for the realities of

changing national policies, budget cycle revamping and inflation.

6.6.1.3.3 Supporting Charts

Chart 1 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.6.1.3.1 to the problems identified in Section 6.6.1.3.2. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which problem areas

b. To show how widespread a problem is by presenting the number of application area tasks affected by that problem

c. Assuming that the more widespread a problem the higher priority for solution, it can be used as the basis for determining a schedule for implementing solutions.

PROBLEMS / TASKS	a. Manual effort and field disruptions for W.O to fulfill information requests	b. Trend analysis and financial prediction not done	c. No tool available to produce randomly required and formatted reports	d. Indirect transmission of information causes loss and misinterpretation	e. Exception reporting not done on a timely, accessible basis	f. No means to include change in ntl. plcy., inflation when doing fincl. forecasting						
a. Meet the accounting and reporting requirements of various concerned Bureaus, Departments and Congress	X		X	X								
b. Provide coordinated control of expenditures and application of funds for all program activities		X		X	X	X						
c. Provide standard and uniform financial statements and reports				X								
d. Recordation of financial data in a consistent and uniform manner				X								
e. Facilitate determination of the fidelity of persons administering public funds and properties												

Chart 1. Problems vs Tasks

Chart 2 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.6.1.3.1 to the current BLM ADP support systems. The matrix is intended to show which application area tasks are currently supported in any degree by automation.

TASKS / CURRENT ADP SUPPORT SYSTEMS	a. Meet the acctg. & reporting regm'ts of various concerned Bureaus, Dept. & Congress	b. Provide coordinated cont. of expenditures & appli. of funds for all prog. activities	c. Provide standard & uniform financial statements and reports	d. Recordation of financial data in a consistent & uniform manner	e. Facilitate determination of fidelity of persons administering public funds & prop's.						
Financial Management	X	X	X	X	X						

Chart 2. Problems vs Current ADP Support

6.6.1.4 Required ADP Capabilities

6.6.1.4.1 Description

Full automation of this application area will require the use of the ADP capabilities described below.

a. Structured data update, retrieval and output capability is used in all aspects of accounting and fund control.

b. Special processing is used in determining trends and patterns.

c. Job execution, interactive on-line is used to input accounting and fund data and display financial statements and reports. Batch would be used to produce statements and report in final, hard copy form.

d. Data base conversion will be used to convert existing data files to the new system.

6.6.1.4.2 Supporting Charts

Chart 3 is a matrix which presents the relationship of the application area tasks and subtasks described in detail in Section 6.6.1.3.1 to the required ADP capabilities identified, specifically, in Section 6.6.1.4.1 and, generally Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required to support the application area tasks and subtasks

b. To show which ADP capabilities provide the most support throughout the application area

c. Assuming the more tasks associated with an ADP capability associated with the greater the need for its development, it can be used as a basis for determining a schedule for development.

Chart 3. ADP Capabilities vs Tasks

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Meet the requirements of various concerned Bureaus, Departments and Congress:																					
1. Accounting	X																X		X		
2. Reporting		X	X																X		
b. Provide coordinated control of funds for all program activities:																					
1. Record expenditures	X																		X		
2. Analyze application of funds									X										X		
c. Provide standard and uniform financial statements and reports		X																	X	X	
d. Recordation of financial data in a consistent and uniform manner	X																		X		
e. Facilitate determination of the fidelity of persons administering public funds and properties	X																			X	

Chart 4 is a matrix which presents the relationship of the required ADP capabilities described in detail in Section 6.6.1.4.2 and generally in Appendix A to the problems identified in Section 6.6.1.3.2. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are needed to help solve the problems in the application area

b. To show which ADP capabilities provide the most support, i.e., help solve the most problems

c. Assuming the more problems solved by an ADP capability the greater the need, it can be used as the basis for determining a schedule for development.

Chart 4. ADP Capabilities vs Problems

ADP CAPABILITIES / PROBLEMS	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
		Retrieval/ Output																			
	Update	Pre-defined	Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Manual efforts and field disruptions for W.O. to fulfill information requests		X																	X		
b. Trend analysis and financial prediction not done									X										X		
c. No tool available to produce reports:																					
1. Randomly required			X																X		
2. Formatted reports		X																	X		
d. Indirect transmission of info causes loss and misinterpretation		X																	X		
e. Exception reporting not done on a timely, accessible basis	X																		X		
f. No means to include change in ntl policy, inflation when doing financial forecasting	X																		X		

6.6.2 BENEFITS

6.6.2.1 Introduction

The benefits of applying specified ADP capabilities to problems in the current BLM situation can be described in terms of:

a. Elimination of last minute workload

b. Increased accuracy

c. Tightened control over financial status

d. Easier access to data

e. Better communication.

6.6.2.2 Detailed Benefits

a. The last minute high-volume workload of processing financial data from program progress reports, vehicle cost reports, stores issues, document face sheets, etc., for end-of-month status reports will be largely eliminated by applying the ADP capability of direct data entry from field offices.

b. Accuracy of line-item financial data entry should increase if local personnel are entering familiar data.

c. Financial status changes entered into the Accounting and Fund Control application would automatically update the associated information in other applications, eliminating multiple entries and processing (i.e., receipt of a oil and gas lease fee into the Accounting application would automatically trigger an update of the lease status information of the land utilization area).

d. The implementation of suggested ADP capabilities will provide a means of automatically indicating the overdue status of bill payments, purchase orders, etc., to tighten control over financial transactions.

e. Financial managers will have much faster access to accounts data than they do now by installing direct data communication capabilities. This will facilitate the monitoring of current year expenditures to prevent imbalance with authorized allocations or contract overruns.

f. Implementation of prescribed ADP capabilities will allow Bureau financial managers to respond within minutes to reporting requests from DOI, OMB and Congress.

g. Financial managers will have a timely and systematic way to present randomly required summary reports to top management.

h. Financial managers will have the statistical tools available as needed to

   1. Predict spending at mid-year for the rest of the fiscal year or over any time period

   2. Perform long-term financial trend analysis as it is related to Bureau spending and meeting program objectives.

i. A more effective, useful, exception reporting capability will be available which will increase the visibility of poor utilization of funds or man-months.

j. Direct ADP data communication between field offices and the financial managers and common access to up-to-date funding and accounting data will:

   1. alleviate the problem of misinterpretating or losing financial information when data communication is indirect (by phone calls, letter, etc.)

   2. allow rapid turn-around between request and receipt of any aggregate of financial information

   3. significantly decrease mail and paper costs

4. free financial managers to do more financial analysis by automating the computation and array of any specified data.

k. The BLM has many recurring standard-formatted financial reporting requirements. Automated training aids on how to use and interpret those reports could significantly decrease the amount of training time a senior financial supervisor expends.

6.6.2.3 Supporting Charts

Chart 5 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.6.1.3.1 to the anticipated benefits identified in Section 6.6.2 and the output products. The matrix is intended to serve four purposes:

a. To provide a list of the generic products associatedwith a task.

b. To show the anticipated benefits associated with a particular task.

c. Assuming that the more anticipated benefits associated with a task the greater the gain to BLM, it can be used as the basis for determining a schedule for implementation

d. To show how widespread a benefit is by presenting the number of application area tasks affected by the benefit.

TASKS	PRODUCTS	BENEFITS											
		a. High-volume month-end pressure eliminated	b. Increased accuracy in financial data entry	c. Elimination of multiple entries in the collections functions	d. Automatic overdue status of bills, orders, payments	e. Ease of monitoring expenditures to prevent overruns and under-runs	f. Random reporting requests done in minutes	g. Random reporting requests done systematically	h. Financial predictions and long-term trend analysis made possible	i. More useful exception reporting	j. More time available for financial analysis	k. Easier to use and understand standard financial reports
a. Meet the accounting and reporting requirements of various concerned Bureaus, Departments and Congress	* See examples below	X	X				X	X			X	
b. Provide coordinated control of expenditures and application of funds for all program activities	* See examples below			X	X	X			X	X	X	
c. Provide standard and uniform financial statements and reports	* See examples below	X	X	X			X				X	X
d. Recordation of financial data in a consistent and uniform manner	* See examples below		X	X								X
e. Facilitate determination of the fidelity of persons administering public funds and properties	* General Ledger Allotment Ledger SF133 Report Cost Report Trusts and Reimbursables Object Class Report											

Chart 5. Tasks vs Products and Benefits

Chart 6 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.6.1.3.1 to the potential BLM users of products generated when the task is automated. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which users

b. To show how many users will receive products from automation of the particular task

c. Assuming that the more anticipated users, the higher the priority for implementation, it can be used as a basis for determining an implementation schedule.

USERS / TASKS	District Staff Specialists	District Staff Area Resource Manager	District Manager	State Staff	State Manager	DSC Staff	DSC Manager	OCS/BIFC Staff	OCS/BIFC Manager	HQ Staff	HQ Manager	
a. Meet the accounting and reporting requirements of various concerned Bureaus, Departments and Congress			X		X		X		X		X	
b. Provide coordinated control of expenditures & application of funds for all program activities			X		X	X	X		X		X	
c. Provide standard & uniform financial statements and reports	X	X	X	X	X	X	X	X	X	X	X	
d. Recordation of financial data in a consistent & uniform manner	X	X	X	X	X	X	X	X	X	X	X	
e. Facilitate determination of the fidelity of persons administering public funds and properties			X		X	X	X		X		X	

Chart 6. Tasks vs Users

Chart 7 is a matrix which presents the relationship of the anticipated benefits described in detail in Section 6.6.2 to the required ADP capabilities identified specifically in Section 6.6.1.4.1 and generally in Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required by this application area to realize the anticipated benefits

b. To show which ADP capabilities provide the most support in terms of the number of benefits associated with a particular ADP capability

c. Assuming the more anticipated benefits associated with an ADP capability the greater the need for the capability, it can be used as the basis for determining

Chart 7. Benefits vs ADP Capabilities

BENEFITS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. High-volume month-end pressure eliminated																					
1. Processing	X																		X		
2. Produce reports		X																	X		
b. Increased accuracy in financial data entry	X																		X		
c. Elimination of multiple entries in the collection functions	X																		X		
d. Automatic overdue status of bills, orders, payments		X																		X	
e. Ease of monitoring expenditure to prevent overruns and under-runs	X																		X		
f. Random reporting requests done in minutes		X																	X		
g. Random reporting requests done systematically			X																X		
h. Financial predictions and long-term trend analysis made possible									X										X		
i. More useful exception reporting	X																		X		
j. More time available for financial analysis:																					
1. Direct entry of data	X																				
2. Faster access		X																			
3. Analysis									X												
k. Easier to use and understand financial reports	X																		X		

be realized if this package is automated. The benefits column numbers correspond to the paragraph numbers in subsection 6.2.2

6.6.3 REQUIREMENTS

6.6.3.1 Introduction

In order to implement this application area, certain requirements must be met. These requirements are displayed on the following charts.

6.6.3.2 Supporting Charts

Chart 8 is a matrix which presents the data sets described in detail in Table 5-1 and in general in Appendix B that will be used by the application area tasks described in detail in Section 6.6.1.3.1. The matrix is intended to serve four purposes:

a. To show which data sets are required to execute application area tasks

b. To show how much use is made of a data set by representing the number of tasks within an application area that use the data set.

c. To show how the particular task uses the data in the data set, i.e., just displays the data, (R) adds new data (W) or corrects existing data. (R/W)

The symbols used at the intersections have the following meanings:

P - Indicates that the data in the data set is read, i.e., displayed on a video screen, in a report, etc., but no updating of the data takes place. This is just a visual display of the data for review, auditing, information, etc. For example, the resource specialist would want to examine previous resource surveys in a paticular area before making a field trip. To do this the various resource data sets are interrogated to determine if a resource survey was performed in the desired area

and if so, what information was gathered in each resource category. This could be done initially using a video device and if the information is useful a hard copy could be obtained.

W - Indicates that the data set or a logical record is initially created without immediate review. An audit trail or error listing may be produced as a result of this update but no use is made of the updated data set. For example, a large amount of information may be added to a data set which would involve a time consuming effort to enter, edit and correct each transaction.

R/W - Indicates the data set is:

1. Created or updated and then used to produce a product. That is, the resource specialist enters the field collected data into the data set, makes corrections, if necessary, and the new data is displayed in a report.

2. Read and after some analysis data in the set is updated. For example, the resource specialist, prior to a field trip, could be perusing resource information from a resource area and, because of that specialist's knowledge of the area, fill in missing information.

R/* - Indicates that while reading the data in a data set a conflict with information in a second data set is discovered. No corrective action is taken at this time. For example, if the resource specialist was examining URAs in the secialists discipline and a discrepancy was noted with the previously examined resource inventory data, a field trip would be required before the discrepancy could be corrected.

It should be noted that the symbol used represents the most common usage of a data set by a task. This does not mean however that another function cannot be performed. The common procedure may be to read (R) only, but on occasion a write (W) or conflict reduction (R/*) may be done.

Detailed menus for each data set are found in Phase IV of the report.

TASKS	DATA SETS																							
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	Program Plans	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
a. Meet the accounting and reporting requirements of various concerned Bureaus, Departments and Congress													R/W								R	
b. Provide coordinated control of expenditures and application of funds for all program activities											R		R/W			R	R				R	
c. Provide standard and uniform financial statements and reports													R/W								R	
d. Recordation of financial data in a consistent and uniform manner											R		R/W			R	R				R	
e. Facilitate determination of the fidelity of persons administering public funds and properties																						

Chart 8. Tasks vs Data Sets

Chart 9 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.6.1.3.1 to data maintained in other application areas and BLM personnel responsible for supplying application input data. The matrix is intended to serve three purposes:

a. To show which other application areas furnish information to the application area task

b. To show the personnel position titles within BLM which are responsible for providing information to the application area task

c. It may indicate critical application area linkages, which would affect the implementation sequence.

Chart 9. Tasks vs Application Area Inputs and Supplier Responsibility

TASKS	APPLICATION AREA INPUTS															SUPPLIERS							
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	EAR/EIS	Regional Analysis	Protection	Service Center Staff	Washington Office Staff	Site Financial Manager	Site Financial Clerks				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15								
a. Meet the accounting and reporting requirements of various concerned Bureaus, Departments and Congress						X										X	X						
b. Provide coordinated control of expenditures & application of funds for all program activities					X	X	X		X	X		X			X	X	X	X					
c. Provide standard & uniform financial statements and reports						X										X	X						
d. Recordation of financial data in a consistent & uniform manner						X	X		X	X		X			X				X				
e. Facilitate determination of the fidelity of persons administering public funds and properties																							

6.6.4 Application Package Relationships

6.6.4.1 Introduction

The following schematic displays the relationship of the Accounting and Fund Controls application package to application areas which support and benefit from it.

6.6.4.2 Relationship Chart

Chart 10 is a graphic presentation of package interrelationships. The numbers associated with each arrow are keyed to a narrative in Section 6.16. The arrows indicate the directional flow of the information.

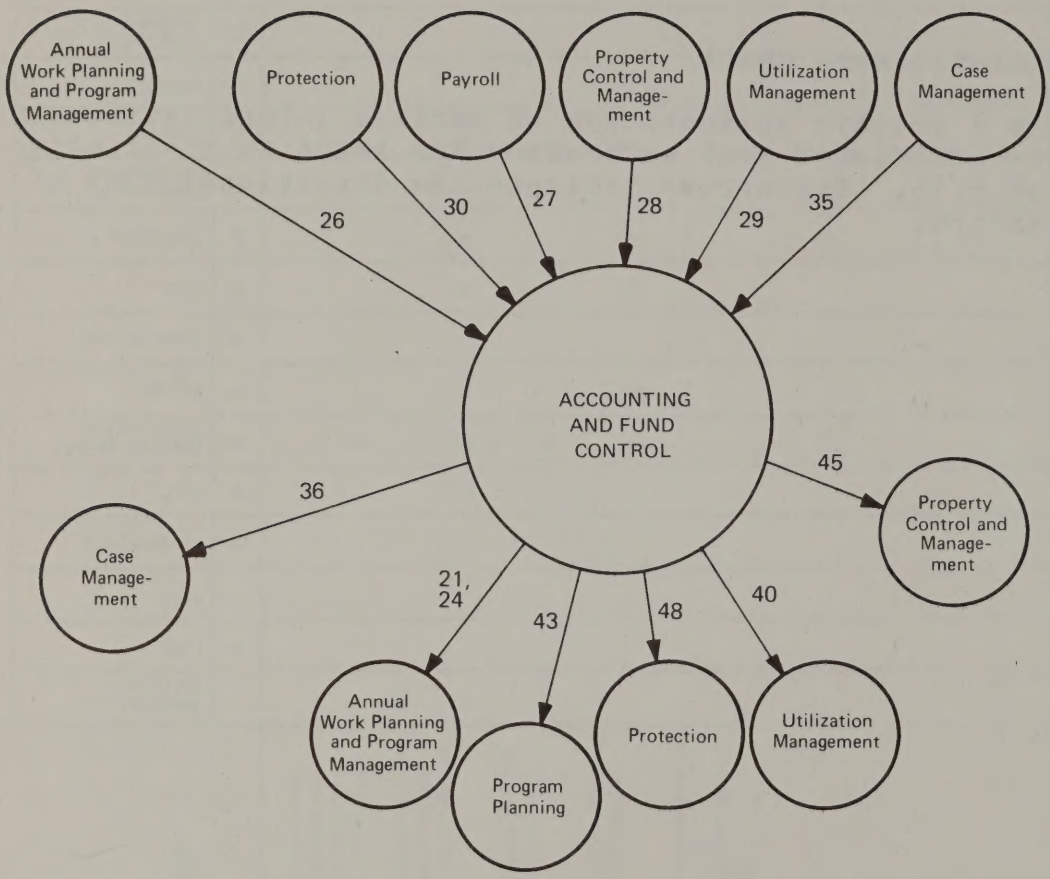

Chart 10. Package Interrelationships

6.6.5 Implementation Options

Because the Accounting and Fund Control Activity is already supported by some automation, implementation of the enhancements and changes provided by this package could be phased on a geographic or organizational basis.

6.7 FINANCIAL MANAGEMENT: PAYROLL

6.7.1 INTRODUCTION

6.7.1.1 Objective

The objective of this application package is to provide more effective automated support for the BLM payroll function. Automated payroll operations in the Bureau are already adequate. However, system enhancements are proposed here which will:

a. Alleviate some of the manual effort now being expended

b. Allow quicker access by payroll specialists to their data.

6.7.1.2 Tasks

The Payroll application tasks that will benefit from implementation of this package are:

a. Time and attendance (T&A):

   1. Recording and reporting

   2. Production of time and attendance (T&A) reports

   3. Issuance of pay checks.

b. Time and attendance (T&A) analysis.

6.7.1.3 Current Situation

6.7.1.3.1 Description

The following descriptive sub-tasks present a picture of how the resource inventory tasks are performed.

a. In the T&A area, the following procedures are followed:

1. The employee records and signs the T&A form for the pay period

2. The timekeeper or supervisor certifies by signing

3. The T&A reports are sent via the fastest mail service to the Branch of Financial Management, Denver Service Center

4. The T&A information is used to calculate employee salary and subsequently a check is issued by the Treasury Dept.

5. Various automated T&A related reports are produced for management.

b. In the T&A analysis area, the T&A data is examined to determine trends and patterns in sick leave, annual leave, part time employee hours, etc.

6.7.1.3.2 Problem Areas

Automation will help in the following problem areas:

a. BLM currently relies on mail service to forward T&A information and reports. This can result in lost records and delayed processing because of slow mail service. Errors made in completing T&A information often takes weeks to correct.

b. Automated trend and pattern analysis can be placed in the hands of the field timekeepers and managers faster than current mail service delivery.

6.7.1.3.3 Supporting Charts

Chart 1 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.7.1.3.1 to the problems identified in Section 6.7.1.3.2. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which problem areas

b. To show how widespread a problem is by presenting the number of application area tasks affected by that problem

c. Assuming that the more widespread a problem the higher priority for solution, it can be used as the basis for determining a schedule for implementing solutions.

PROBLEMS / TASKS	a. Mail services slowness	b. Trend and pattern analysis										
a. T&A	X											
b. T&A Analysis		X										

Chart 1. Problems vs Tasks

Chart 2 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.7.1.3.1 to the current BLM ADP support systems. The matrix is intended to show which application area tasks are currently supported in any degree by automation.

TASKS / CURRENT ADP SUPPORT SYSTEMS	a. T&A	b. T&A Analysis										
Financial Management	X	X										

Chart 2. Problems vs Current ADP Support

6.7.1.4 Required ADP Capabilities

6.7.1.4.1 Description

Each of the approximately 4,500 regular employees and all of the temporary hirees must submit a T&A for each pay period. While a necessary job, the time consuming element is the transmission of this data. It can be minimized by automation of this application with direct access to the Denver Service Center.

a. The structured data update, retrieval and output capabilities must be developed to maintain current automated support in the payroll area.

b. An enhancement to basic capability would be to provide BLM with the ability to do calculations and trending provided in the special processing capability.

c. Job execution, interactive on-line is used to input T&A data and display payroll reports.

d. Data base conversion will be used to convert existing data files to the new system.

6.7.1.4.2 Supporting Charts

Chart 3 is a matrix which presents the relationship of the application area tasks and subtasks described in detail in Section 6.7.1.3.1 to the required ADP capabilities identified, specifically, in Section 6.7.1.4.1 and, generally Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required to support the application area tasks and subtasks

b. To show which ADP capabilities provide the most support throughout the application area

c. Assuming the more tasks associated with an ADP capability associated with the greater the need for its development, it can be used as a basis for determining a schedule for development.

Chart 3. ADP Capabilities vs Tasks

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. T&A																					
1. Record and sign T&A	X																		X		
2. Supervisor or timekeeper sign	X																		X		
3. T&A reports sent to DSC	X																		X		
4. Calculate salary									X												
5. Produce reports		X															X		X		
b. T&A Analysis																					
1. Trend and pattern analysis									X												
2. Produce reports		X															X		X		

Chart 4 is a matrix which presents the relationship of the required ADP capabilities described in detail in Section 6.7.1.4.1 and generally in Appendix A to the problems identified in Section 6.7.1.3.2. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are needed to help solve the problems in the application area

b. To show which ADP capabilities provide the most support, i.e., help solve the most problems

c. Assuming the more problems solved by an ADP capability the greater the need, it can be used as the basis for determining a schedule for development.

Chart 4. ADP Capabilities vs Problems

PROBLEMS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Mail service slowness	X																		X		
b. Trend and pattern analysis									X										X		

6.7.2 Benefits

6.7.2.1 Introduction

The benefits of applying specified ADP capabilities to problems in the current BLM situation can be described in terms of:

a. Faster access to T&A information

b. Quicker production of T&A reports

c. Easier performance of analytical studies.

6.7.2.2 Detailed Benefits

a. Direct input of T&A data from the field to the service center will:

   1. Decrease mail and paper costs

   2. Improve T&A edit turn-around

   3. Free service center manpower for other work.

b. Approved personnel will have the tools to perform various trend and pattern analyses:

   1. Sick leave usage trends for individuals or groups

   2. Annual leave usage trends for individuals or groups

   3. Payroll predictions over time.

c. The annual identification of employees with leave to use or lose could be automated and save the distribution of forms to 4500 people. The manual calculation of such leave by each employee when only a small percentage of them are actually affected would be eliminated.

d. Approved personnel would have a systematic way to present randomly required payroll summaries to Management. It will no longer be necessary to sift through unrequested data and manually compile the requested information.

6.7.2.3 Supporting Charts

Chart 5 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.7.1.3.1 to the anticipated benefits identified in Section 6.7.2 and the output products. The matrix is intended to serve four purposes:

a. To provide a list of the generic products associatedwith a task.

b. To show the anticipated benefits associated with a particular task.

c. Assuming that the more anticipated benefits associated with a task the greater the gain to BLM, it can be used as the basis for determining a schedule for implementation

d. To show how widespread a benefit is by presenting the number of application area tasks affected by the benefit.

TASKS	PRODUCTS	BENEFITS										
		a. Direct input of T&A	b. Trend and pattern analysis	c. Leave to use or lose	d. Payroll summaries							
a. T&A	• T&A reports, i.e. sick leave, ext.	X										
	• Randomly required T&A reports											
b. T&A Analysis	• T&A reports											
	• Randomly required T&A reports	X	X	X	X							
	• T&A notice of recordation											

Chart 5. Tasks vs Products and Benefits

Chart 6 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.7.1.3.1 to the potential BLM users of products generated when the task is automated. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which users

b. To show how many users will receive products from automation of the particular task

c. Assuming that the more anticipated users, the higher the priority for implementation, it can be used as a basis for determining an implementation schedule.

USERS / TASKS	District Manager	District Timekeepers	State Managers	State Timekeepers	DSC Staff							
a. T&A		X		X	X							
b. T&A Analysis	X		X		X							

Chart 6. Tasks vs User

Chart 7 is a matrix which presents the relationship of the anticipated benefits described in detail in Section 6.7.2 to the required ADP capabilities identified specifically in Section 6.7.1.4.1 and generally in Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required by this application area to realize the anticipated benefits

b. To show which ADP capabilities provide the most support in terms of the number of benefits associated with a particular ADP capability

c. Assuming the more anticipated benefits associated with an ADP capability the greater the need for the capability, it can be used as the basis for determining a development schedule.

Chart 7. Benefits vs ADP Capabilities

BENEFITS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Direct input of T&A	X																		X		
b. Trend and pattern analysis									X										X		
c. Leave to use or lose		X																	X		
d. Payroll summaries			X																X	X	

6.7.3 Requirements

6.7.3.1 Introduction

To realize the benefits outlined in the previous section, the application package will need the support described in the following charts.

6.7.3.2 Supporting Charts

Chart 8 is a matrix which presents the data sets described in detail in Table 5-1 and in general in Appendix B that will be used by the application area tasks described in detail in Section 6.7.1.3.1. The matrix is intended to serve four purposes:

a. To show which data sets are required to execute application area tasks

b. To show how much use is made of a data set by representing the number of tasks within an application area that use the data set.

c. To show how the particular task uses the data in the data set, i.e., just displays the data, (R) adds new data (W) or corrects existing data. (R/W)

The symbols used at the intersections have the following meanings:

R - Indicates that the data in the data set is read, i.e., displayed on a video screen, in a report, etc., but no updating of the data takes place. This is just a visual display of the data for review, auditing, information, etc. For example, the resource specialist would want to examine previous resource surveys in a paticular area before making a field trip. To do this the various resource data sets are interrogated to determine if a resource survey was performed in the desired area and if so, what information was gathered in each resource category. This could be done initially using a video device and if the information is useful a hard copy could be obtained.

W - Indicates that the data set or a logical record is initially created without immediate review. An audit trail or error listing may be produced as a result of this update but no use is made of the updated data set. For example, a large amount of information may be added to a data set which would involve a time consuming effort to enter, edit and correct each transaction.

R/W - Indicates the data set is:

1. Created or updated and then used to produce a product. That is, the resource specialist enters the field collected data into the data set, makes corrections, if necessary, and the new data is displayed in a report.

2. Read and after some analysis data in the set is updated. For example, the resource specialist, prior to a field trip, could be perusing resource information from a resource area and, because of that specialist's knowledge of the area, fill in missing information.

R/* - Indicates that while reading the data in a data set a conflict with information in a second data set is discovered. No corrective action is taken at this time. For example, if the resource specialist was examining URAs in the secialists discipline and a discrepancy was noted with the previously examined resource inventory data, a field trip would be required before the discrepancy could be corrected.

It should be noted that the symbol used represents the most common usage of a data set by a task. This does not mean however that another function cannot be performed. The common procedure may be to read (R) only, but on occasion a write (W) or conflict reduction (R/*) may be done.

Detailed menus for each data set are found in Phase IV of the report.

Chart 8. Tasks vs Data Sets

TASKS	DATA SETS																					
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	MAP/MAP	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
a. T&A																R/W						
b. T&A analysis																R/W						

Chart 9 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.7.1.3.1 to data maintained in other application areas and BLM personnel responsible for supplying application input data. The matrix is intended to serve three purposes:

a. To show which other application areas furnish information to the application area task

b. To show the personnel position titles within BLM which are responsible for providing information to the application area task

c. It may indicate critical application area linkages, which would affect the implementation sequence.

Chart 9. Tasks vs Application Area Inputs and Supplier Responsibility

TASKS	APPLICATION AREA INPUTS															SUPPLIERS							
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	EAR/EIS	Regional Analysis	Protection	District Staff	District Manager	DSC Staff	HQ Staff	Special Office Manager	Special Office Staff	State Staff	State Manager
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15								
a. T&A																X		X	X		X	X	
b. T&A Analysis																	X	X	X	X			X

6.7.4 Application Package Relationships

6.7.4.1 Introduction

While a package is designed to be implemented without automated dependence on other packages, a relationship will still exist. This section will provide the reader with a pictorial portrayal of this relationship.

6.7.4.2 Relationship Chart

Chart 10 is a graphic presentation of package inter-relationships. The connecting lines and arrows show the flow of the information and the number associated with the line refers to an explantory paragraph in Section 6.16.

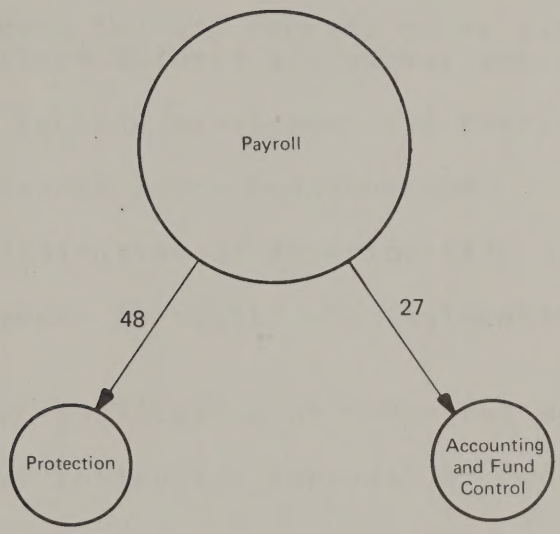

Chart 10. Package Interrlationships

6.7.5 Implementation Options

Because BLM already has an adequate payroll support system, the only practical option is the geographic (BLM sites) phasing in of the enhanced Package including whatever changes are necessary to the current system to integrate it into the total conceptual system.

6.8 LAND RECORDS MANAGEMENT

6.8.1 INTRODUCTION

6.8.1.1 Objective

The objecive, in this application area, is to provide automated support in the management of land records. This will give BLM the following:

a. Reliable records control

b. Timely access to land records data, i.e., MT and Use Plats, various indexes and survey notes

c. Decreased records management and retrieval workload

d. Reduced storage space requirements

e. Virtual elimination of deterioration of plat sheets

f. Rapid response to public and legislative land status inquiries

g. Streamlined publication of Cadastral survey notes

h. Streamlined review and approval of Cadastral survey plats.

6.8.1.2. Tasks

The tasks which will benefit from implementation of this application package are:

a. Posting of Plats

   1. Delineation of Use Plats

   2. Delineation of MT Plats

b. Posting of Historical and other Indexes

c. Cadastral survey note preparation.

6.8.1.3 Current Situation

6.8.1.3.1 Description

a. Posting of Plats with abbreviated notational information. This information is required when an application is filed, rejected or canceled. Posting of Plats is accomplished by hand drawing abbreviated lettering, conforming to BLM standards for abbreviations, style etc., on a master plat vellum overlay.

1. Delineate by drawing on Use Plats the perimeter of the land specified in the use application. When issued, the perimeter of the land area is adjusted, to conform to the land description in the lease or permit. Delineation of perimeter on Use Plats is accomplished by hand drawing, in ink or using approval zip tape or other materials, on the master Use Plat vellum overlay. Standards in line width, type of line, such as dashed, dat-dished etc., and other standards for drawing the different types of boundaries are adhered to.

2. Delineate by drawing on MT Plats the perimeter of the lands applied for in the application. Delineation would include Allowable Entry on Public Lands, Acquisition, Disposal, Withdrawls, Rights-of-Way, Know Geologic Structure, Coal Leasing Area and Geothermal Resource Areas. Newly approvals plats and protractions of survey require the transfer of this information onto MTPs.

b. Posting of Historical Index. This is done by typing in an allowance of entry, patents, fractional interest Indian patents, issurance of leases and permits, termination of leases and permits, lease assignments, withdrawl application and terminations, orders of withdrawls, classifications and designations.

Posting other Indexes. The appropriate notation is placed on the Mineral Location and Contest Sheet Index and the Acquired Lands Historical Index. Posting of Historical Index (HI) Mineral Location/Contest Sheet Index and Acquired Lands Historical Index requires:

1. Determining what will be posted in relationship to the transaction being performed. As an example, in processing an application to lease oil and gas the Historical Index would not be posted, however, in processing the issuance of this lease the HI would be posted.

2. The appropriate index would be posted by typing information into the appropriate next open line or other designated area.

c. Cadastral survey note preparation. After preparation they are transmitted to the Washington Office for review, approval and publication. Cadastral survey note preparation is primarily a text publication task where the field notes are edited, formatted and typed. The typist would correct the additions, deletions, spacing, formatting, etc., to produce final drafts. The drafts are reviewed and revised into final form at which time they are approved and formally published.

During the verification process, a hand drawn plat is developed from the boundary descriptive information within the narrative text, thus determining omissions, type graphical errors or other errors requiring corrective actions.

6.8.1.3.2 Problem Areas

a. The State Office operation with its Land Status Records System is a keystone in management and operation of the BLM mission. At preset the Land and Reality case load runs about 120,000 cases per year closed and 50,000 cases per year pending, with a large portion of this work load addressing minerals cases. These cases are processed through the system, which has about a dozen forms to add to any input filings, applications or correspondence. The input documents and forms then pass through about a dozen key processes. The results of these cases are then portrayed on Master Title Plates, Use Plats and half a dozen indexes. About 40 to 50 ground rules exists in the posting of the results on to the Land Status Records.

While this process may appear cumbersome to the uniniated observer, it does work. However, future work loads, added to the present work load base, could bog it down. For instance:

1. 8000 additional easements are needed to unblock BLM Lands.

2. The present public inquiry rate on land ownership status runs about 2000 to 2500 per year via BLM-WO and about 100 to 200 per day at each of the State Offices.

3. Simultaneous Oil and Gas Filings are running at over 115,000 filings per month against less than 1500 tracts offered per month.

4. 200 roads and trails per year are being added to BLM lands; these require posting.

5. Pressures to process and distribute the products and benefits of the national resources call for more railroad lines, pipelines and electrical utility coridors.

6. The passage of S1040/HR5442 will have to handle up to 10 million mining claims all of which are filed at county courthouses. These claims, dating back to the 1800's will have to be filed with BLM in a 2 to 3 year time frame or the mining rights owner shall lose his claim.

b. The posting of Use Plats with abbreviated notation and the drawing of use boundary by hand has several drawbacks:

1. The myriad of standard abbreviations required in posting, as well as the size and type of letters to be drawn using black ink, pre-printed zip tape, etc., cause this task to be quite tedious and requires a high level of accuracy resulting in extensive time to perform this task.

2. Delineation of boundary lines also requires strict adherance to such things as line width, standard

map symbols, solid lines, dashed lines, etc., resulting in extensive time spent to perform this task.

c. The drawing of survey lines on MT plats has similar drawbacks as mentioned above and has unique standards for townships, section, quarter section, track and lot delineation and notation.

d. The need for multiple copies of plats causes problems in keeping all copies at the same level of currency, revising the master copy is time consuming, reproduction costs are high, replacing pages in the Public Room books is time consuming and time delays and postages costs are incurred in mailing updates to the district offices.

e. Site surveys conducted during this study shows that field people feel a need to present the public with more easily interpreted formats on land record plats.

f. Cadastral survey activity, in 1974, performed original surveys on some 4 1/2 million acres of land and resurveys on 3/4 million acres of land. Much of this activity results in record keeping and mapping activity at the State Office. The time presently required to draft, edit, transmit to Washington Office for review and approval, finalize and publish cadastral survey notes accounts for as much as thirty percent of the workload at Cadastral Survey offices. Considerable time is expended at the state offices in the revision of MT plats upon receipt of an approval plat or protraction of survey.

Hand drawn plats derived from the text of the survey hosts, to verify the accuracy of the narrative survey description is a tedious and time consuming task especially when there are a number of pre-final draft revisions.

6.8.1.3.3 Supporting Charts

Chart 1 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.8.1.3.1

to the problems identified in Section 6.8.1.3.2. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which problem areas

b. To show how widespread a problem is by presenting the number of application area tasks affected by that problem

c. Assuming that the more widespread a problem the higher priority for solution, it can be used as the basis for determining a schedule for implementing solutions.

PROBLEMS / TASKS	a. Case file load	b. Posting of use plats	c. Posting of MT plats	d. Plat currency	e. Bad formats	f. Cadastral Survey note publication						
a. Post Plat	X	X	X	X	X							
b. Post Indexes	X		X	X								
c. Prepare Survey Notes						X						

Chart 1. Problems vs Tasks

Chart 2 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.8.1.3.1 to the current BLM ADP support systems. The matrix is intended to show which application area tasks are currently supported in any degree by automation.

TASKS / CURRENT ADP SUPPORT SYSTEMS	a. Posting of plats	b. Posting of indexes	c. Cadastral Survey note preparation									
Cadastral Survey Notes			X									
Cadastral Survey Needs			X									
Land base	X											
Map/Model	X											
CRIS	X											

Chart 2. Problems vs Current ADP Support

6.8.1.4. ADP Capabilities

6.8.1.4.1. Description

BLM, in fiscal year 1973, closed 122,812 and had pending 49,498 cases. The figures for the preceding two years were approximately the same. The MT and Use Plats must reflect the status of the land and, in some cases, this will require a Cadastral survey or resurvey. Cadastral surveys are also performed on non-Bureau lands and to aid legislation and management control. Approximately, 340 surveys are done per year to meet these needs. The land description information would be entered into the system using the structural data handling update capability. Using the pre-defined retrieval/output capability the updated MT and Use Plats can be displayed to check their status and accuracy. The text processing update, retrieval/output and composition capabilities should be developed to provide BLM with the ability to easily publish the notes taken on a Cadastral survey.

A brief description of each required ADP Capability as it relates to the task or tasks which it supports is described in the following paragraphs:

a. Structured Data Handling:

   1. Update -- adds new or modifies previous Master Title and Use plats and notation. Automatic generation of use and title boundaries would be performed.

   2. Predefined retrieval/output -- retrieves and displays Master Title Plat, Use Plat and Index information.

b. Mapping/Graphics:

   1. Data entry/modification -- used in positioning MTP and Use Plat displays for annotation.

   2. Retrieval/output -- display for reference purposes or to verify results of actions prior to updating the Lands Records data set.

c. Text Processing:

1. Update -- adds new or modifies existing cadastral survey note text.

2. Composition -- retrieves modified text during cadastral survey note composing phase and prints for final publication.

d. Computer Assisted training would be used in survey note composition phase to guide the typist through editing processes.

e. Job execution -- interactive would be used in all phases of land records management

f. Data base conversion would be used to convert existing land records data into the new files.

6.8.1.4.2 Supporting Charts

Chart 3 is a matrix which presents the relationship of the application area tasks and subtasks described in detail in Section 6.8.1.3.1 to the required ADP capabilities identified, specifically, in Section 6.8.1.4.1 and, generally Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required to support the application area tasks and subtasks

b. To show which ADP capabilities provide the most support throughout the application area

c. Assuming the more tasks associated with an ADP capability associated with the greater the need for its development, it can be used as a basis for determining a schedule for development.

Chart 3. ADP Capabilities vs Tasks

TASKS/SUBTASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Posting of Use Plats																					
1. Select MT or Use Plat																					
(a) notation and vector attribute		X															X		X		
(b) MT overlay					X														X		
2. Type in notation	X																		X		boundary delineation done automatically
3. Display new MT or Use Plat					X														X		
b. Posting of Historical and Other Indexes																					
1. Select desired index		X															X		X		
2. Type in notation	X																		X		
3. Display new index		X																	X		
c. Cadastral Survey note preparation																					
1. Type in text						X											X		X		
2. Edit and correct						X									X				X		
3. Publish								X											X		

Chart 4 is a matrix which presents the relationship of the required ADP capabilities described in detail in Section 6.8.1.4.1 and generally in Appendix A to the problems identified in Section 6.8.1.3.2. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are needed to help solve the problems in the application area

b. To show which ADP capabilities provide the most support, i.e., help solve the most problems

c. Assuming the more problems solved by an ADP capability the greater the need, it can be used as the basis for determining a schedule for development.

Chart 4. ADP Capabilities vs Problems

ADP CAPABILITIES / PROBLEMS	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Projected increase workload	X																		X		
b. Use plot posting and drawing boundaries	X																		X		
c. Title boundary drawing	X																		X		
d. Need for multiple copies					X														X		
e. Need easy to read format for public					X														X		
f. Need to speed Cadastral survey note publication								X											X		

6.8.2 Benefits

6.8.2.1 Introduction

The benefits of applying specified ADP capabilities to solve current situation problems can be described in terms of:

a. More efficient use of time and manpower, thus increasing productivity.

b. Increased availability, throughout BLM, of Master Title and Use plat information.

c. Reduced time delay between completion of cadastral surveys and publication of final survey notes.

d. Identification of millions of acres of Federal mineral ownership throughout the country will soon impact BLM. This system will provide support which would have otherwise been met with additional staffing, training and storage facilities.

e. Immediate retrieval of up to date historical indexes to district and area offices.

6.8.2.2 Detailed Benefits

The following benefits could be derived by automation of this application package:

a. Increased productivity of the state, OCS and other office staffs tasked with posting land status and drawing MT and Use plats will be realized. This becomes very important because of the growing volume of BLM authorization transactions (license, lease, sale-application, terminations, relinquishments, etc.). This increased productivity will be realized by the ADP system providing:

   1. Ease of posting transaction notation on plats via keyboard/display as opposed to current manual practice of hand drawn notation. A ten minute scribing task would require only the thirty seconds or so necessary to type in the transaction.

2. Generating Use plat boundary lines, that is, drawing lines of the boundary for an authorized land use, will be done automatically upon entry of BLM standard delineation notation, (i.e., Section 2: All; Sec 3: S 1/2; Sec 4:NE 1/4). The need to perform the current manual task of drawing these boundary lines will thus be eliminated.

3. Generating title/ownership boundary lines with corresponding notation can be accomplished through the use of computer programs. This will result in a time savings over the present manual method of drawing and revising this MTP information in pen and ink. Although the lay-out preparation time required may be about the same, the total time required to draw a boundary would be saved. A one hour or one day drawing task would be done by the system.

b. Elimination of the need for multiple copies of MT and Use plat would be realized. BLM presently requires a master copy, Public Room copy, and copies to periodically be sent to district and other offices. Since the land status data base is kept current by the posting and plat maintenance functions, the user requesting display and/or hard copy will retrieve this current plat.

c. Continued protection for original MT and Use plats (currently stored/microfilmed) would be realized. The system would provide master and backup tapes and disks in lieu of film products.

d. The ADP system would increase the accuracy and usefulness of MT and Use plats, sometimes lacking in the present manual system, by providing:

1. Editing assistance in notation and delineation (computer prompting). This will ensure uniformity of standard abbreviations and map symbols on displayed/printed plats.

2. Replacement of abbreviated notation with long titles for Public Room display.

e. Reduced manhours presently expended to compose, edit, transmit, approve and publish formal casastral survey notes through use of computer assistance in word (text) processing.

f. Elimination of the present need for extraction of survey line delineation data from survey notes for MTP update. The ADP system will extract and format this data for direct input into the Plat Maintenance Application.

g. Make complete historical indexes available to the district.

6.8.2.3 Supporting Charts

Chart 5 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.8.1.3.1 to the anticipated benefits identified in Section 6.8.2 and the output products. The matrix is intended to serve four purposes:

a. To provide a list of the generic products associatedwith a task.

b. To show the anticipated benefits associated with a particular task.

c. Assuming that the more anticipated benefits associated with a task the greater the gain to BLM, it can be used as the basis for determining a schedule for implementation

d. To show how widespread a benefit is by presenting the number of application area tasks affected by the benefit.

TASKS	PRODUCTS	BENEFITS										
		a. MT and Use Plat posting ease	b. Single copy	c. Protection of original	d. Increased utility	e. Cadastral survey note publication	f. East of updating MTPs					
a. Posting of plats	• Display of user specified township and MT use plats or sections. • Display of all posting inputs with clear indication of format and syntax errors • MT and Use Plats	X	X	X	X		X					
b. Posting of indexes	• Display of Historical Index • Display of Mineral Location and Contest sheet index • Display of all posting inputs with clear indication of format and syntax errors			X	X							
c. Cadastral Survey Note Preparation	• Intermediate survey notes • Unapproved survey notes • Final published survey notes • Formatted survey boundary descriptors			X	X	X						

Chart 5. Tasks vs Products and Benefits

Chart 6 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.8.1.3.1 to the potential BLM users of products generated when the task is automated. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which users

b. To show how many users will receive products from automation of the particular task

c. Assuming that the more anticipated users, the higher the priority for implementation, it can be used as a basis for determining an implementation schedule.

PROBLEMS / TASKS	State Staff	DSC	Hq. Staff	OCS Staff								
a. Posting of Plats	X	X		X								
b. Posting of Indexes	X	X		X								
c. Preparation of Cadastral Survey notes	X	X	X	X								

Chart 6. Tasks vs User

Chart 7 is a matrix which presents the relationship of the anticipated benefits described in detail in Section 6.8.2 to the required ADP capabilities identified specifically in Section 6.8.1.4.1 and generally in Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required by this application area to realize the anticipated benefits

b. To show which ADP capabilities provide the most support in terms of the number of benefits associated with a particular ADP capability

c. Assuming the more anticipated benefits associated with an ADP capability the greater the need for the capability, it can be used as the basis for determining a development schedule.

Chart 7. Benefits vs ADP Capabilities

BENEFITS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. MT and use plat posting ease	X																		X		
b. Single copy	X																		X		
c. Protection of original	X																		X		
d. Increased utility		X																	X		
e. Cadastral survey note preparation								X												X	
f. East of updating MTPs	X																		X		

6.8.3 Requirements

6.8.3.1 Introduction

To realize the benefits outlined in the previous section, the application package will need the support described in the following charts.

6.8.3.2 Supporting Charts

Chart 8 is a matrix which presents the data sets described in detail in Table 5-1 and in general in Appendix B that will be used by the application area tasks described in detail in Section 6.8.1.3.1. The matrix is intended to serve four purposes:

a. To show which data sets are required to execute application area tasks

b. To show how much use is made of a data set by representing the number of tasks within an application area that use the data set.

c. To show how the particular task uses the data in the data set, i.e., just displays the data, (R) adds new data (W) or corrects existing data. (R/W)

The symbols used at the intersections have the following meanings:

R - Indicates that the data in the data set is read, i.e., displayed on a video screen, in a report, etc., but no updating of the data takes place. This is just a visual display of the data for review, auditing, information, etc. For example, the resource specialist would want to examine previous resource surveys in a paticular area before making a field trip. To do this the various resource data sets are interrogated to determine if a resource survey was performed in the desired area and if so, what information was gathered in each resource category. This could be done initially using a video device and if the information is useful a hard copy could be obtained.

W - Indicates that the data set or a logical record is initially created without immediate review. An audit trail or error listing may be produced as a result of this update but no use is made of the updated data set. For example, a large amount of information may be added to a data set which would involve a time consuming effort to enter, edit and correct each transaction.

R/W - Indicates the data set is:

1. Created or updated and then used to produce a product. That is, the resource specialist enters the field collected data into the data set, makes corrections, if necessary, and the new data is displayed in a report.

2. Read and after some analysis data in the set is updated. For example, the resource specialist, prior to a field trip, could be perusing resource information from a resource area and, because of that specialist's knowledge of the area, fill in missing information.

R/* - Indicates that while reading the data in a data set a conflict with information in a second data set is discovered. No corrective action is taken at this time. For example, if the resource specialist was examining UPAs in the secialists discipline and a discrepancy was noted with the previously examined resource inventory data, a field trip would be required before the discrepancy could be corrected.

It should be noted that the symbol used represents the most common usage of a data set by a task. This does not mean however that another function cannot be performed. The common procedure may be to read (R) only, but on occasion a write (W) or conflict reduction (R/*) may be done.

Detailed menus for each data set are found in Phase IV of the report.

Chart 8. Tasks vs Data Sets

TASKS	DATA SETS																					
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	Program Plans	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
a. Posting of Plats										R/W	R											
b. Posting of indexes										R/W	R											
c. Preparation of Cadastral Survey notes																		R/W				

Chart 9 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.8.1.3.1 to data maintained in other application areas and BLM personnel responsible for supplying application input data. The matrix is intended to serve three purposes:

a. To show which other application areas furnish information to the application area task

b. To show the personnel position titles within BLM which are responsible for providing information to the application area task

c. It may indicate critical application area linkages, which would affect the implementation sequence.

Chart 9. Tasks vs Application Area Inputs and Supplier Responsibility

TASKS	APPLICATION AREA INPUTS															SUPPLIERS							
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	Protection	Regional Analysis	EAR/EIS	State Office	Office Cadastral Survey	Hq. Office					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15								
a. Posting of plats	This application package does not require input from other applications															X							
b. Index posting																X							
c. Prepare survey notes																X	X	X					

6.8.4 Application Package Relationship

6.8.4.1 Introduction

While a package is designed to be implemented without automated dependence on other packages, a relationship will still exist. This section will provide the reader with a portrayal of this relationship.

6.8.4.2 Relationship Chart

Chart 10 is a graphic presentation of application package interrelationships. The connecting lines and arrows show the flow of the information and the number associated with the line refers to an explanatory paragraph in Section 6.16.

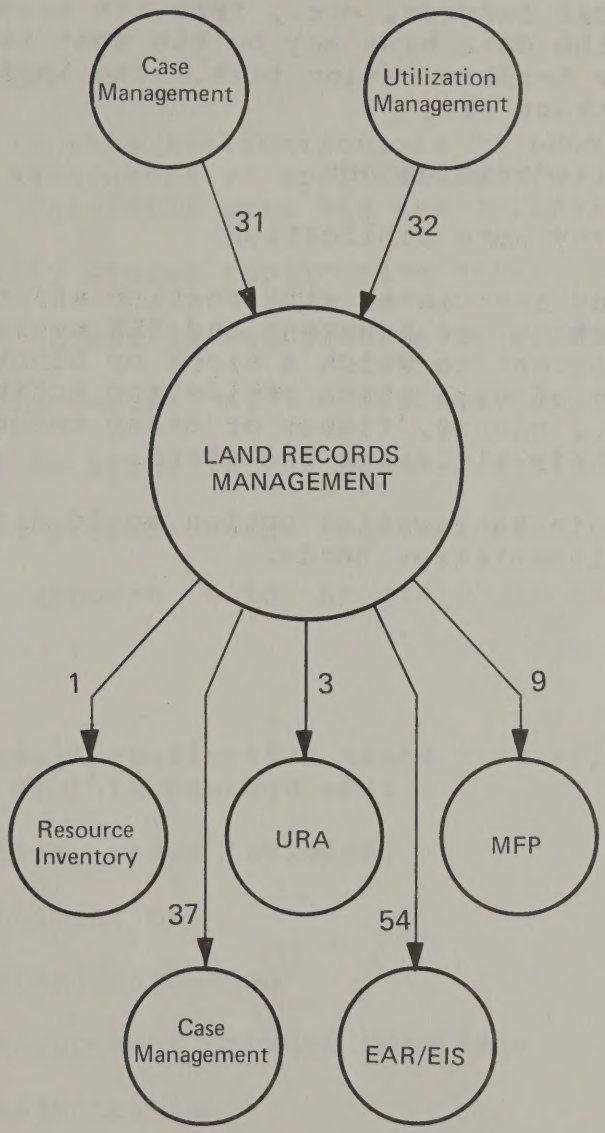

Chart 10. Package Interrelationships

6.8.5 Implementation Options

Converting existing data contained in Cadastral survey notes, MT and Use plats, Historical Indexes, etc., from its present form to the form required for the data base may be the most time consuming and expensive implementation task. The implementation options within this package are:

a. Posting and plat maintenance

b. Cadastral survey note publication.

The implementing options associated with posting and plat maintenance in this package are numerous and BLM management would need to determine the extent to which a block or blocks of land within the jurisdiction of each state office are active enough in Use Authorization (i.e., energy, timber or other resources), to warrant implementing their title and Use Plats.

The Cadastral Survey Note Publication option would also need scrutinizing as to implementation needs.

6.9. CASE MANAGEMENT

6.9.1 Introduction

6.9.1.1 Objective

The objective, in this Application, is to provide automated support in the management of applications for users, licences, permits, etc. This will give BLM the following:

a. Centrally stored application data

b. Timely access to information concerning an application

c. Reliable control of the application

d. Prompt notification of pending actions

e. Reduced storage space requirements

f. Rapid response as to the status of the application.

6.9.1.2 Tasks

The Case Management application tasks that will benefit from implementation of this package are:

a. Case flow, which includes:

   1. Initiation

   2. Preadjudication

   3. Management Options Selection

   4. Adjudication.

b. Appraisal.

6.9.1.3 Current Situation

6.9.1.3.1 Descriptions

a. In the case flow area, the technical services and records management staffs of the state offices, and in some cases, like grazing permit renewal, the district offices perform any part of the following functions that are needed for a particular application:

1. Initiation:

(a) Bureau motion or a filing triggers the caseflow system

(b) The application is stamped with the date and time of receipt and given a serial number.

(c) The serial register is updated

(d) The application and any other information or forms are assembled in a case file folder

(e) The land and status records are posted

(f) If a fee is involved, the accounting records are notified and a receipt is written.

(g) If a rent is involved it is computed.

(h) The acreage involved is computed

(i) A status report is prepared.

2. Preadjudication:

(a) The application is examined to ensure the following information is recorded (list is not all-inclusive):

(1) Fee paid
(2) Adequate description
(3) Right of possession
(4) Acreage limitations
(5) Location of exposed vein
(6) Accurate acreage figures
(7) Signature

(8) Number of copies.

(b) The following supporting papers, as examples, are examined:

(1) Copies of plot and notes
(2) Statement about proof of posting on claim
(3) Copies of notice
(4) Copies of location certificate
(5) Abstract of title
(6) Citizenship statement.

(c) The land status report is examined to determine:

(1) Availability for entry
(2) Relocation
(3) Conflicts
(4) Ownership of adjoining lands.

3. Management Option Selection:

(a) Reviews available information in the resource

(b) Inventory, URA and MFP areas. Coordinate the ground work with other agencies

(c) Conduct the field examination,determines, among other things the validity of the application

(d) Determines the impact on other resources

(e) Compiles a technical report including recommendations

(f) In the land acquisition area the following functions are performed:

(1) Inspect the property
(2) Analyze any encumbrances
(3) Check the deed
(4) Negotiate a price and in cases where that is not possible, condemn the property
(5) Analyze county records

(6) Check acreage from GLO plat
(7) Obtain abstract
(8) Obtain solicitor's opinion.

4. Adjudication:

(a) Ensure payment has been made on recurring contracts

(b) Determine stipulations to be imposed

(c) Advertise the impending action

(d) Accept bids

(e) Prepare a list of bids

(f) Hold an auction

(g) Establish a performance bond

(h) Resolve any protests

(i) Post the tract book, plats, and title abstract

(j) Prepare and issue a lease, license, permit or patent

(k) Record in county records (if land acquisition).

b. In the appraisal area, the person assigned to perform the appraisal does the following:

1. Examines the land and surrounding areas

2. Checks comparable sales and rental data

3. Performs comparison analysis

4. Prepares an appraisal report.

6.9.1.3.2 Problem Areas

Automation will help the resource specialist in the following problem areas:

a. A file of all current and past leases, permits and sales including the dates, locations, appropriate EAR, special stipulations and production figures is required for proper management of use authorizations.

   The present case load of 122,812 cases closed and 49,498 cases pending in FY73, along with the fact that some combination of 107 different forms apply to these case actions, makes it impossible to properly assess the status of the total use authorization activity or any particular lease or group of leases. With such a large volume of applications, lost or mislaid applications are possible.

b. The procedures for the posting of information to the land status records needs to be streamlined and simplified. Unnecessary delays are encountered when the land status records are not properly updated.

c. Blocked BLM lands are a problem because about 8000 easements have to be identified and access negotiated for or easement obtained by condemnation proceedings. This involves a major effort in record keeping and status identification.

d. The filing fee and rent collection posting procedures need to be streamlined to enable the accounting system to be more responsive to monetary inquiries.

e. Appraisals are difficult to perform because the necessary data (comparable sales and rentals, adjacent resources, costs, etc.) are not readily available.

f. Keeping track of a contested application is difficult and time consuming.

g. The Bureau needs to maintain information on the qualifications of a corporation as well as that of an individual.

h. The problem of conflict resolution and unclaimed mining area determination is not efficient.

i. BLM does not know when claims have been filed with the county for minerals on BLM land or for which BLM is responsible.

6.9.1.3.3 Supporting Charts

Chart 1 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.9.1.3.1 to the problems identified in Section 6.9.1.3.2. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which problem areas

b. To show how widespread a problem is by presenting the number of application area tasks affected by that problem

c. Assuming that the more widespread a problem the higher priority for solution, it can be used as the basis for determining a schedule for implementing solutions.

PROBLEMS / TASKS	a. Case file volume	b. Land record posting	c. Easement recording	d. Monetary record keeping	e. Appraisal data inaccessibility	f. Contested case tracking	g. Company/individual qualification	h. Conflict resolution	i. Inter-agency communication			
a. Case flow												
1. Initiation	X	X	X	X								
2. Preadjudication	X							X				
3. Management Options Selection	X	X	X					X				
4. Adjudication	X	X	X			X	X		X			
b. Appraisal	X				X							

Chart 1. Problems vs Tasks

Chart 2 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.9.1.3.1 to the current BLM ADP support systems. The matrix is intended to show which application area tasks are currently supported in any degree by automation.

TASKS / CURRENT ADP SUPPORT SYSTEMS	a. CASEFLOW											
	1. Initiation	2. Preadjudication	3. Management Option Selection	4. Adjudication	b. Appraisal							
Oil shale/Bentonite	X	X	X	X								
Mineral Ownership			X									
Lease Management					X							
Communication Site Appraisal					X							
CRIS					X							
OCS Post Sale Analysis				X								
Range Management				X								

Chart 2. Problems vs Current ADP Support

6.9.1.4 Required ADP Capabilities

6.9.1.4.1 Description

BLM, in fiscal year 1973, closed 122,812 and had pending 49,498 cases. The figures for the preceding two years were approximately the same. It is planned, based on previous figures, that in fiscal year 1975 14,201 man-months will be expended in doing case work. Managing the land and resources involves not only doing what is best for the land and resources but also helping the public and the government get the best use from the land and resources. To provide prompt and accurate service on all applications is an essential part of the BLM mission. ADP can help achieve this goal by providing support in the structured data update, retrieval and output area. This will allow for rapid editing of an application for completeness and fast processing of an application so the public can "get on the ground" more quickly, thus benefiting the user and the government.

Special processing should be developed to allow BLM to compute acreages and fees quickly and accurately, determine trends and compare past rents, sales, etc., to determine the current market situation more accurately.

Textual processing will give the resource specialist the capability to keep abreast of the ever changing resource market so a better technical report can be produced. Also, the information contained in supporting papers can be abstracted, stored with keyword highlights and cross referenced to the application for later use.

Another feature that aids the resource specialist in the preparation of a technical report is type map retrieval and output.

Microfilm storage saves space and can be indexed to a computer file. This will allow the resource specialist to peruse the entire supporting document if necessary.

Job execution, interactive on-line, is used in all phases to update, retrieve and display the application, land, supporting paper abstracts and mathematical calculations.

Data base conversion would to convert existing data into the new data base.

6.9.1.4.2 Supporting Charts

Chart 3 is a matrix which presents the relationship of the application area tasks and subtasks described in detail in Section 6.9.1.3.1 to the required ADP capabilities identified, specifically, in Section 6.9.1.4.1 and, generally Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required to support the application area tasks and subtasks

b. To show which ADP capabilities provide the most support throughout the application area

c. Assuming the more tasks associated with an ADP capability associated with the greater the need for its development, it can be used as a basis for determining a schedule for development.

Chart 3. ADP Capabilities vs Tasks

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing				Image Processing					Computer Assisted Training				Job Execution		Comments
		Retrieval/ Output																			
	Update	Pre-defined	Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition	Special Processes	Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local	Data Base Conversion	Microfilm	Interactive Online	Batch	
a. Case flow:																					
1. Initiation:																					
(a) Bureau motion/filing	X																X		X		
(b) Date/time stamped	X																		X		
(c) Serialized and registered	X																		X		
(d) Assemble:																					
(1) Application		X																	X		
(2) Supporting papers							X											X			
(e) Post land status record	X																		X		
(f) Collect fee and notify accounting	X																		X		
(g) Compute:																					
(1) Rent									X										X		
(2) Acreage									X										X		
(h) Prepare status report		X																		X	
2. Preadjudication																					
(a) Examine application for:		X																	X		
(1) Fee paid																					
(2) Adequate description																					
(3) Right of possession																					
(4) Acreage limitations																					
(5) Location of exposed vein																					
(6) Accurate acreage figure																					
(7) Signature																					
(8) Number of copies																					
(b) Examine support papers:							X											X			
(1) Copies of plat and notes																					
(2) Proof of posting statement																					
(3) Copies of notices																					
(4) Copies of location certificate																					
(5) Abstract of title																					
(6) Citizenship statement																					
(c) Examine land and status record		X																	X		
(1) availability for entry																					
(2) relocation																					
(3) conflicts																					
(4) ownership of adjoining land																					
(d) Examine other applications for conflicts		X															X		X		

Chart 3. ADP Capabilities vs Tasks (Continued)

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
		Retrieval/ Output																			
	Update	Pre-defined	Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
(e) Correct/update/note application info discrepancies	X																		X		
3. Management Options Selection																					
(a) Review resource, URA, MFP:																					
(1) Attribute data		X																	X		
(2) Type maps					X														X		
(b) Coordinate with other agencies																					ADP will not be able to provide assistance in these areas
(c) Conduct field examination																	X				
(d) Determine other resource impact																					
(e) Compile technical report							X														
(f) Record info on land record	X																		X		
4. Adjudication																					
(a) Insure recurring payment made		X																	X		
(b) Determine stipulations	X																		X		
(c) Advertise impending action																					
(d) Accept bids	X																		X		
(e) Compile list of bids		X																	X		
(f) Hold auction																					
(g) Establish performance bond	X																		X		
(h) Solve protests																					
(i) Post:																					
(1) Tract book	X																		X		
(2) Plats	X																		X		
(j) Prepare and issue lease, etc.		X																	X		
b. Appraisal																					
1. Examine land																					
2. Check comparable sales and rental data		X																	X		
3. Perform comparison analysis									X										X		
4. Prepare appraisal report		X																		X	

(This page intentionally left blank.)

Chart 4 is a matrix which presents the relationship of the required ADP capabilities described in detail in Section 6.9.1.4.1 and generally in Appendix A to the problems identified in Section 6.9.1.3.2. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are needed to help solve the problems in the application area

b. To show which ADP capabilities provide the most support, i.e., help solve the most problems

c. Assuming the more problems solved by an ADP capability the greater the need, it can be used as the basis for determining a schedule for development.

Chart 4. ADP Capabilities vs Problems

PROBLEMS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
		Retrieval/ Output																			
	Update	Pre-defined	Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Centralized storage of applications	X																		X		
b. Posting procedures	X																		X		
c. Blocked lands:																					
1. Record keeping	X																		X		
2. Status identification		X																	X		
d. Posting rent and filing fee	X																		X		
e. Perform appraisals:																					
1. Application data		X																	X		
2. Comparisons									X										X		
3. Technical literature							X												X		
f. Contested application:																					
1. Updating	X																		X		
2. Tracking		X																	X		
g. Corporate qualifications																					
h. Conflict resolution		X			X														X		
i. County filings		X																	X		

6.9.2 Benefits

6.9.2.1 Introduction

The benefits of applying specified ADP capabilities to problems in the current BLM situation can be described in terms of:

a. More efficient use of time and manpower

b. More complete and accurate case information

c. Faster response to applications

d. Faster and more accurate response to public inquiries

e. Increased land and resources management capability.

6.9.2.2 Detailed Benefits

a. Each state office receives hundreds of initial and renewal applications to utilize the resources and land managed by BLM. Some applications like grazing permit renewals are handled by the district office. Each application is examined by the state or district staff for completeness and accuracy, i.e., adequate land description, accurate acreage figures, etc. The handling of such a large volume too often results in lost, mislaid or incomplete applications causing unnecessary delays. An automated system will improve and standardize the application handling process by centrally storing and indexing the data and then checking it for completeness. This will facilitate keeping track of an application and data as well as increasing the accuracy and speed of filing.

b. A fee is required with the majority of applications and an automated system can transfer the necessary information to the accounting system for faster and easier processing. The current manual system could result in lost fee information thus causing unnecessary delays.

c. The hundreds of MTPs affected by an application are manually located in filing cabinets, updated with descriptive notations and examined for conflicts by the state staff.

d. In order to conduct an accurate appraisal on the hundreds of appropriate applications, the appraiser needs to have access to comparable sales and rental data, type of adjacent resources and various price and cost measures. Once this data is gathered and kept current the automated system can use this information to quickly, easily and accurately calculate and display the results of various appraisal algorithms and/or just display the data. The availability of this information will lessen the overall time required to conduct the appraisal and presale and postsale analysis be easier.

e. The normal flow of an application can be disrupted if, for any number of reasons, the lease, license, permit, etc., is not granted or a protest is filed. The applicant or protestor will appeal, then there could be a counter-appeal and finally a judgement will be issued. Automation can monitor the progress of an application as it flows through this process by recording the appeals information. This information would then be available for later review and follow up analysis.

f. Information concerning the land status records can be transferred quickly and accurately to the Land Records application by an automated system. Once the data is entered in the Case Management system the data is automatically transferred to Land Records thus eliminating duplicate entry and saving time.

g. An automated system could be used to show the district manager the number, size and graphic representations of blocked plots in the district. This would allow for easier easement determination and transportation plans, e.g., what would need to be done to get to a particular stand of timber and harvest it. Coordination with state, county and other federal agencies in road planning, and the ability to establish road use fees would be easier.

h. When a competitive sale is conducted or scheduled to be conducted a list of qualified bidders (companies and individuals) should be contacted. The contents of the notification letter can be produced automatically, with the information about the sale, price, location, etc., and the envelope addressed.

i. The link between state, county and other federal agency computer systems could be established, thus allowing for access to unpatented mining claim data, related resource area transactions, etc.

6.9.2.3 Supporting Charts

Chart 5 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.9.1.3.1 to the anticipated benefits identified in Section 6.9.2 and the output products. The matrix is intended to serve four purposes:

a. To provide a list of the generic products associatedwith a task.

b. To show the anticipated benefits associated with a particular task.

c. Assuming that the more anticipated benefits associated with a task the greater the gain to BLM, it can be used as the basis for determining a schedule for implementation

d. To show how widespread a benefit is by presenting the number of application area tasks affected by the benefit.

TASKS	PRODUCTS	BENEFITS										
		a. Centralized storage and indexing	b. Accounting interface	c. Easy access to MTPs	d. Easy access to appraisal related data	e. Contest tracking	f. Land records interface	g. Easement determination	h. Qualified bidders list	i. Interagency interface		
a. Case flow												
1. Initiation	• List of current applications by location, type and status											
	• Sorted list of simultaneous lease filings	X	X				X					
	• List of patents granted, permits or leases issued and sales conducted including stipulations											
2. Pre-adjudication	• Sorted list of simultaneous lease filings											
	• Various easement reports											
	• MT and Use Plats with application location	X	X	X		X	X	X		X		
	• MT and Use Plats with existing claims, mines, grazing areas, etc.											
3. Management Option Selection	• Various easement reports											
	• Appraisal reports											
	• MT and Use Plats with application location	X		X			X					
	• MT and Use Plats with existing claims, mines, grazing areas, etc.											
	• Abstracts of titles, technical reports, BLM decisions, etc.											
4. Adjudication	• Sorted list of simultaneous lease filings											
	• Appeal process progress report											
	• Various easement reports											
	• Appraisal reports											

Chart 5. Tasks vs Products and Benefits

TASKS	PRODUCTS	BENEFITS										
		a. Centralized storage and indexing	b. Accounting interface	c. Easy access to MTPs	d. Easy access to appraisal related data	e. Contest tracking	f. Land records interface	g. Easement determination	h. Qualified bidders list	i. Interagency interface		
4. (cont.)	• List of patents granted, permits or leases issued and sales conducted with stipulations											
	• List of bonds required by application	X	X	X		X	X	X	X	X		
	• MT and Use Plats with application location											
	• MT and Use Plats with existing claims, mines, grazing areas, etc.											
	• Overlay of base map with claims, mines, etc.											
	• Abstract of titles, technical reports, etc.											
b. Appraisal	• Appraisal report											
	• MT and Use Plats with application location											
	• MT and Use Plats with existing claims, mines, grazing areas, etc.	X			X		X					
	• Overlay of base map with claims, mines, O&G leases, etc.											
	• Abstracts of titles, technical reports, BLM decisions, etc.											

Chart 5. Tasks vs Products and Benefits (Continued)

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Chart 6 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.9.1.3.1 to the potential BLM users of products generated when the task is automated. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which users

b. To show how many users will receive products from automation of the particular task

c. Assuming that the more anticipated users, the higher the priority for implementation, it can be used as a basis for determining an implementation schedule.

USERS / TASKS	District Staff Resource Specialist	District Staff Resource Area Manager	District Staff Manager	Special Office Staff	Special Office Manager	State Office Staff Records Management	State Office Staff Technical Services	State Office Manager				
a. Caseflow												
1. Initiation	X	X	X	X	X	X	X	X				
2. Preadjudication	X	X		X		X	X					
3. Management Options Selection	X			X			X					
4. Adjudication	X	X	X	X	X	X	X	X				
b. Appraisal	X	X	X	X	X	X	X	X				

Chart 6. Tasks vs User

Chart 7 is a matrix which presents the relationship of the anticipated benefits described in detail in Section 6.9.2 to the required ADP capabilities identified specifically in Section 6.9.1.4.1 and generally in Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required by this application area to realize the anticipated benefits

b. To show which ADP capabilities provide the most support in terms of the number of benefits associated with a particular ADP capability

c. Assuming the more anticipated benefits associated with an ADP capability the greater the need for the capability, it can be used as the basis for determining a development schedule.

Chart 7. Benefits vs ADP Capabilities

BENEFITS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Application:																					
1. Centralized storage/indexing	X																		X		
2. Checked for completeness	X																		X		
3. Tracking		X																	X		
b. Accounting system interface	X																		X		
c. MT Plats:																					
1. Locating		X																	X		
2. Updating	X																		X		
3. Conflict identification									X										X		
d. Appraisal data:																					
1. Gathering	X																		X		
2. Access		X																	X		
3. Comparison									X										X		
e. Contested case:																					
1. Recording	X																		X		
2. Review		X					X												X		
f. Land records posting	X																		X		
g. Easement determination		X																	X		
h. Qualified bidders:																					
1. Maintenance	X																			X	
2. List	X																			X	
i. Interagency interface		X																	X		

6.9.3 Requirements

6.9.3.1 Introduction

To realize the benefits outlined in Section 6.9.2, the application package will need the support described in the following charts.

6.9.3.2 Supporting Charts

Chart 8 is a matrix which presents the data sets described in detail in Table 5-1 and in general in Appendix B that will be used by the application area tasks described in detail in Section 6.9.1.3.1. The matrix is intended to serve three purposes:

a. To show which data sets are required to execute application area tasks

b. To show how much use is made of a data set by representing the number of tasks within an application area that use the data set.

c. To show how the particular task uses the data in the data set, i.e., just displays the data, (R) adds new data (W) or corrects existing data. (R/W)

The symbols used at the intersections have the following meanings:

R - Indicates that the data in the data set is read, i.e., displayed on a video screen, in a report, etc., but no updating of the data takes place. This is just a visual display of the data for review, auditing, information, etc. For example, the resource specialist would want to examine previous resource surveys in a paticular area before making a field trip. To do this the various resource data sets are interrogated to determine if a resource survey was performed in the desired area and if so, what information was gathered in each resource category. This could be done initially using a video device and if the information is useful a hard copy could be obtained.

W - Indicates that the data set or a logical record is initially created without immediate review. An audit trail or error listing may be produced as a result of this update but no use is made of the updated data set. For example, a large amount of information may be added to a data set which would involve a time consuming effort to enter, edit and correct each transaction.

P/W - Indicates the data set is:

1. Created or updated and then used to produce a product. That is, the resource specialist enters the field collected data into the data set, makes corrections, if necessary, and the new data is displayed in a report.

2. Read and after some analysis data in the set is updated. For example, the resource specialist, prior to a field trip, could be perusing resource information from a resource area and, because of that specialist's knowledge of the area, fill in missing information.

P/* - Indicates that while reading the data in a data set a conflict with information in a second data set is discovered. No corrective action is taken at this time. For example, if the resource specialist was examining URAs in the secialists discipline and a discrepancy was noted with the previously examined resource inventory data, a field trip would be required before the discrepancy could be corrected.

It should be noted that the symbol used represents the most common usage of a data set by a task. This does not mean however that another function cannot be performed. The common procedure may be to read (R) only, but on occasion a write (W) or conflict reduction (R/*) may be done.

Detailed menus for each data set are found in Phase IV of the report.

Chart 8. Tasks vs Data Sets

TASKS	DATA SETS																					
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	MAP/MAP	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
a. Caseflow:																						
1. Initiation	R	R	R	R	R	R	R	R	R	R/W	R/W		W					R				
2. Preadjudication										R	R/W	R						R				
3. Management Options Selection	R	R	R	R	R	R	R	R	R	R/W	R/W	R						R				
4. Adjudication										R/W	R/W							R/W				
b. Appraisal	R	R	R	R	R	R	R	R	R	R/W	R/W	R/W										

Chart 9 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.9.1.3.1 to data maintained in other application areas and BLM personnel responsible for supplying application input data. The matrix is intended to serve three purposes:

a. To show which other application areas furnish information to the application area task

b. To show the personnel position titles within BLM which are responsible for providing information to the application area task

c. It may indicate critical application area linkages, which would affect the implementation sequence.

Chart 9. Tasks vs Application Area Inputs and Supplier Responsibility

TASKS	APPLICATION AREA INPUTS															SUPPLIERS							
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	EAR/EIS	Regional Analysis	Protection	State Staff	District Staff	Special Office Staff					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15								
a. Caseflow																							
1. Initiation								X								X	X	X					
2. Preadjudication								X						X		X	X	X					
3. Management Options Selection	X							X						X		X	X	X					
4. Adjudication								X						X		X	X	X					
b. Appraisal								X						X		X	X	X					

6.9.4 Application Package Relationships

6.9.4.1 Introduction

While a package is designed to be implemented without automated dependence on other packages, a relationship will still exist. This section will provide the reader with a pictorial portrayal of this relationship.

6.9.4.2 Relationship Chart

Chart 10 is a graphic presentation of package interrelationships. The connecting lines and arrows show the flow of the information and the number associated with the line refers to an explanatory paragraph in Section 6.16.

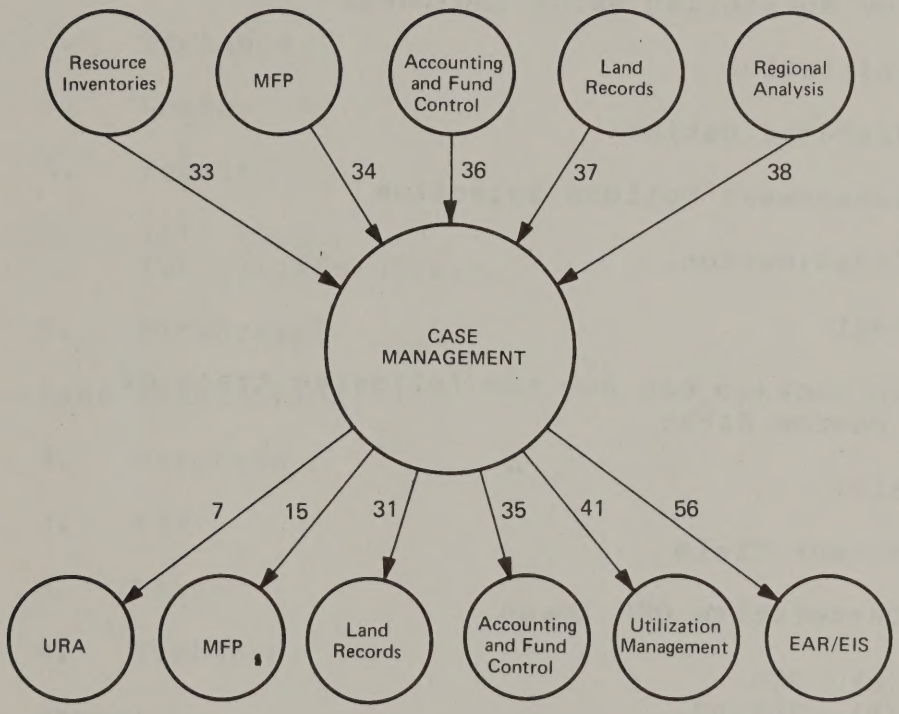

Chart 10. Package Interrelationships

6.9.5 Implementation Options

Converting existing application data from its present form to the form required for the data base may be the most time consuming and expensive implementation task.

The Case Management Application Package is composed of the following tasks:

a. Caseflow Monitoring which includes:

   1. Initiation

   2. Preadjudication

   3. Management Options Selection

   4. Adjudication.

b. Appraisal

In addition, the package can use the following types of information as source data:

a. Minerals:

   1. Patent Claim

   2. Competative O&G Lease

      (a) OCS
      (b) Upland.

   3. Non-competitive O&G Lease

   4. Geothermal Lease

   5. Other than O&G Lease including prospecting

   6. Mineral material sale

   7. Free use license

   8. Simultaneous O&G lease.

b. Land:

1. Sale

(a) R&PP
(b) Public
(c) Small tract.

2. Desert Land Entry Grant

3. Exchange

4. Lease

5. Permit

(a) Slup
(b) Rights-of-way.

6. Withdrawal.

c. Land Acquisition:

1. Purchase

2. Gift

3. Lease

4. Exchange.

d. Range:

1. Lease

2. License

3. Permit

4. Cooperative Agreement (Construction).

e. Forest:

1. Sale

(a) Competative
(b) Non-competative.

2. Free use permit.

Any mixture of source data types and tasks can be selected and combined for implementation to fit BLM needs. It should be noted that when a particular ADP capability is developed to support any selected implementation, it will then be available to any further implementation efforts which require that capability.

Any combination of sources and tasks that produce a useful product could be implemented. For example; caseflow monitoring of OCS competitive O&G leases and Appraisal of Timber Sale information could be chosen independently or sequentially for implementation.

The choice of tasks and source data will affect conversion requirements directly. If, for example, the OCS O&G competitive lease information for use in caseflow is implemented the amount of data required would be much less than if all districts implement all upland mineral leases and grazing permits.

6.10 UTILIZATION MANAGEMENT

6.10.1 Introduction

6.10.1.1 Objective

The objective, in this application area, is to provide automated support in the management of approved applications (resource utilization). This will give BLM the following:

a. Timely access to approved application information

b. Aid in stipulation violation determination

c. Assistance in prompt notification of bills due.

6.10.1.2 Tasks

The Utilization Management tasks that will benefit from implementation of this package are:

a. Compliance checking

b. Trespass identification and processing

c. Notification of bills due.

6.10.1.3 Current Situation

6.10.1.3.1 Description

a. In the compliance checking area, the person designated to monitor a case performs the following functions:

1. Coordinates with USGS

2. Inspects the site to:

(a) Determine amount of material removed

(b) Modify/extend or terminate contract

(c) Make recommendations.

3. Prepares final inspection report.

4. Updates the case file.

b. In the trespass identification and processing area, the person designated to determine trespass performs the following functions:

1. Investigates for violation of law or stipulations

1. Prepares a trespass report

2. Puts available information on trespass record

3. Issues notice of trespass

4. Initiates cancellation action if violation involves BLM contract

5. Administers settlement and participates in litigation and seizure

6. Prepares a final disposition report.

c. In the notification of bills due area, the following functions are performed by the state or district records management staff:

1. Identify which contracts have monetary obligations

2. Determine the date monies are due

3. Notify the applicant in advance of due date

4. Note in case file when payment was received

5. Notify applicants of overdue bills

6. Initiate cancellation procedures when bill is not paid within required legal time frame.

6.10.1.3.2 Problem Areas

Automation will help the monitoring function in the following problem areas:

a. BLM needs a system for locating all current and past leases, licenses, permits, claims, sales, patents, cooperative agreements and deeds by geographic area with dates, locations, appropriate EAR, special stipulations and production figures. BLM should be able to monitor the step by step progress in completing use authorizations.

b. Special stipulations need to be easily monitored. For example, construction contractors are required to send archeologists to evaluate sites prior to construction work. At present this cannot be followed and enforced. A data retrieval from the appropriate leasing, permit and construction contract data sets is needed to permit a rudimentary monitoring/ enforcement program.

c. Record and maintain a record of contact with the allottee.

d. Need a better system for identifying and inventorying trespass.

e. A tickler system and schedule for compliance checks and reapplication is needed.

f. Need a catalog of decisions for various grazing and minerals authorization cases.

g. System for lease billings and changes is needed.

h. System for land status interfaced with special stipulations for use authorizations for parcels of land withdrawn by other Federal agencies.

i. System for retrieving previous contest cases by geographical location where validity has been determined.

j. The annual Statistical Report has tabulations on grazing fees, number of livestock on Public Lands, number of

acres under various management practices etc. There is a need to be able to easily and quickly retrieve this type of data in various combinations from different sources and files, particularly questions dealing with range improvements and their status.

k. The Range Condition Report is required by law to be generated every five years. At present BLM is 10 years behind in providing this report.

l. Need to measure and predict fluctuations in forage production; need to have the water and climatic variables; i.e., in the spring BLM issues grazing authorization. How do you later tell the livestock operator to make changes to prevent over-utilizing the grazing resource. Capacities are set on averages. BLM does not have equations on the relationships of the variables (let alone adequate survey and measurements techniques). But BLM does need to explore and plot the patterns.

6.10.1.3.3 Supporting Charts

Chart 1 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.10.1.3.1 to the problems identified in Section 6.10.1.3.2. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which problem areas

b. To show how widespread a problem is by presenting the number of application area tasks affected by that problem

c. Assuming that the more widespread a problem the higher priority for solution, it can be used as the basis for determining a schedule for implementing solutions.

PROBLEMS / TASKS	a. Lease, license, permit, etc. location	b. Special stipulations monitoring	c. Contact maintenance	d. Trespass identifying and recording	e. Compliance checks	f. Catalog of decisions	g. Lease billing	h. Inter-agency stipulations	i. Contest case monitoring	j. Annual Statical Report Production	k. Range Condition Report production	l. Variable recordation
a. Compliance checking	X	X	X		X	X	X	X	X	X	X	X
b. Trespass identification and processing	X	X		X								
c. Notification of bills due	X		X		X							

Chart 1. Problems vs Tasks

Chart 2 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.10.1.3.1 to the current BLM ADP support systems. The matrix is intended to show which application area tasks are currently supported in any degree by automation.

TASKS / CURRENT ADP SUPPORT SYSTEMS	a. Compliance checking	b. Trespass identification & processing	c. Notification of bills due									
Lease Management	X											
Range Management	X		X									
Material Sales	X		X									
Oil Shale/Bentonite	X		X									
Land Base	X		X									

Chart 2. Problems vs Current ADP Support

6.10.1.4 Required ADP Capabilities

6.10.1.4.1 Description

BLM, in fiscal year 1973, closed 122,812 and had pending 49,498 cases. Each one had to be monitored to ensure compliance with the stipulations. For recurring leases a notice had to be issued that payment was due. Both jobs require a significant amount of BLM time and manpower. ADP can assist by making available information concerning the license, lease, permit, etc., more efficiently using the structured data update and retrieval/output capability.

The special processing capability should be developed to allow faster and more accurate calculation of the amount of material extracted.

The people that are to receive recurring billings can be readily identified and notified by keeping a list using retrieval/output.

Job execution-interactive online would be used to enter contract modification, update the case file, etc. directly into the data base. This data could be extracted and displayed in initial review and analysis. Batch would be used to extract and display reports, notices, and contracts.

6.10.1.4.2 Supporting Charts

Chart 3 is a matrix which presents the relationship of the application area tasks and subtasks described in detail in Section 6.10.1.3.1 to the required ADP capabilities identified, specifically, in Section 6.10.1.4.1 and, generally Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required to support the application area tasks and subtasks

b. To show which ADP capabilities provide the most support throughout the application area

c. Assuming the more tasks associated with an ADP capability associated with the greater the need for its

development, it can be used as a basis for determining a schedule for development.

Chart 3. ADP Capabilities vs Tasks

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Compliance checking																					
1. Coordinate with USGS																					
2. Inspect the site to:																					
(a) Determine amount of material removed									X												
(b) Modify the contract	X																		X		
(c) Extend the contract	X																		X		
(d) Terminate the contract	X																		X		
(e) Make recommendations	X																		X		
3. Prepare final inspection report		X																		X	
4. Update case file	X																		X		
b. Trespass identification and processing																					
1. Investigate for violation		X																	X		
2. Prepare trespass report		X																		X	
3. Update trespass record	X																		X		
4. Issue notice of trespass		X																		X	
5. Initiate cancellation action	X																		X		
6. Administer settlement and participate in litigation and seizure	X																		X		
7. Prepare final disposition report		X																		X	
c. Notification of bills due																					
1. Identify contractual monetary obligations		X																	X		
2. Determine date monies due		X																	X		
3. Notify applicant when due		X																		X	
4. Note case file when received	X																		X		
5. Notify applicant of overdue		X																		X	
6. Initiate cancellation	X																		X		

Chart 4 is a matrix which presents the relationship of the required ADP capabilities described in detail in Section 6.10.1.4.1 and generally in Appendix A to the problems identified in Section 6.10.1.3.2. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are needed to help solve the problems in the application area

b. To show which ADP capabilities provide the most support, i.e., help solve the most problems

c. Assuming the more problems solved by an ADP capability the greater the need, it can be used as the basis for determining a schedule for development.

Chart 4. ADP Capabilities vs Problems

PROBLEMS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Lease, license, permit, etc. location		X																	X		
b. Special stipulation monitoring		X																	X		
c. Contact maintenance	X																		X		
d. Trespass:																					
1. Identification		X																	X		
2. Recordation	X																		X		
e. Compliance checks		X																	X		
f. Catalog of decisions							X												X		
g. Lease billing		X																		X	
h. Interagency stipulations		X																	X		
i. Contest case monitoring		X																	X		
j. Statistical Report:																					
1. Calculation									X											X	
2. Preparation		X																		X	
k. Range Condition Report:																					
1. Calculations									X											X	
2. Preparation		X																		X	
l. Variable:																					
1. Recordation	X																			X	
2. Checking		X																		X	
3. Algorithm									X											X	

6.10.2 Benefits

6.10.2.1 Introduction

The anticipated benefits of applying specified ADP capabilities to problems in the current BLM situation can be described in terms of:

a. More efficient use of time and manpower

b. Ability to easily monitor stipulation compliance

c. Better notification of when bills are due and received.

6.10.2.2 Detailed Benefits

a. After a lease, permit, license, etc., is issued the district staff must: manually check for compliance by comparing on-ground data with stipulations; determine if amount of material removed is amount contracted for; make modifications or extensions; determine and process trespass; and issue bills and receive notification of monies paid. An automated system containing basic lease, license, permit, etc. data and updated by data obtained from monitoring, can quickly identify stipulation violations, easily and accurately calculate amount of material extracted, such as timber cut, and the amount of monies due and received.

b. An automated system would provide the capability to obtain an overall picture of the resource situation in the areas of energy, grazing, timber, etc. by amassing data concerning the various parts. For example, OCS O&G leases, upland O&G leases, upland minerals leases, etc., would provide information concerning the energy situation and mineral depletion. This could be used as a precursory warning of mineral exhaustion or call attention to unusual activity in an area. The over-all picture would be used in BLM program and project plans to determine future activity in an area. Also, this information could be vital in determining future application approval.

c. If the compliance, billing and trespass information concerning the hundreds of applications a district monitors is entered into the system, the authorization progress could be watched as it travels through the system. Each time the applicant is contacted, billed or monitored, the appropriate information is posted to the application data base. Trespass and content information is also recorded in the application for later reference. Automation will allow, at a glance, the easy monitoring of case progress.

d. The district and state staffs needs to know various legal and BLM decisions concerning the hundreds of applications it processes in order to properly manage the issuance of contracts. Automation will help BLM by providing an automated key word look-up and display capability.

e. BLM needs to know what other Federal, State, and county agencies are doing with geographically adjacent applications. An automated system would provide this linkage.

f. The annual statistical report can be easily and accurately produced by automation when all or part of the data is in a computer compatible form.

g. Automation would provide BLM with a capability to produce any desired case related report using the data in the package.

6.10.2.3 Supporting Charts

Chart 5 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.10.1.3.1 to the anticipated benefits identified in Section 6.10.2 and the output products. The matrix is intended to serve four purposes:

a. To provide a list of the generic products associatedwith a task.

b. To show the anticipated benefits associated with a particular task.

c. Assuming that the more anticipated benefits associated with a task the greater the gain to BLM, it can be used as the basis for determining a schedule for implementation

d. To show how widespread a benefit is by presenting the number of application area tasks affected by the benefit.

TASKS	PRODUCTS	BENEFITS										
		a. Access to centrally stored lease, license, permit, etc.	b. Overall picture	c. Case monitoring	d. Decision access	e. Other agency interface	f. PLS	g. Related case information				
a. Compliance Checking	• List of outstanding leases, licenses, permits, etc. • List of cancellations and the reason • List of trespass and violation • Amount of material extracted • Public land statistics • Range Condition Report • Technical reports	X	X	X	X	X	X	X				
b. Trespass Identification and Processing	• List of outstanding leases, licenses, permits, etc. • List of cancellation and the reason • List of trespass and violation • Amount of material extracted • Technical reports	X	X	X	X	X		X				
c. Notification of Bills Due	• Monies due report • Bills sent statement • Bills paid statement • Technical report	X		X								

Chart 5. Tasks vs Products and Benefits

Chart 6 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.10.1.3.1 to the potential BLM users of products generated when the task is automated. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which users

b. To show how many users will receive products from automation of the particular task

c. Assuming that the more anticipated users, the higher the priority for implementation, it can be used as a basis for determining an implementation schedule.

USERS / TASKS	District Staff Resource Area Specialist	District Staff Resource Area Manager	District Staff Manager	State Staff								
a. Compliance checking	X	X	X									
b. Trespass identification & processing	X	X	X									
c. Notification of bills due	X	X	X	X								

Chart 6. Tasks vs User

Chart 7 is a matrix which presents the relationship of the anticipated benefits described in detail in Section 6.10.2 to the required ADP capabilities identified specifically in Section 6.10.1.4.1 and generally in Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required by this application area to realize the anticipated benefits

b. To show which ADP capabilities provide the most support in terms of the number of benefits associated with a particular ADP capability

c. Assuming the more anticipated benefits associated with an ADP capability the greater the need for the capability, it can be used as the basis for determining a development schedule.

Chart 7. Benefits vs ADP Capabilities

BENEFITS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Access to centrally stored lease, license, permit, etc.:																					
1. Update with field data	X																		X		
2. Modify/extend/cancel	X																		X		
3. Stipulation checking									X										X		
4. Issue bills due		X																		X	
5. Note payment	X																		X		
b. Overall picture		X																	X		
c. Case file:																					
1. Contact	X																		X		
2. Monitoring		X																	X		
d. Decision access							X												X		
e. Other agency interface		X																	X		
f. PLS		X																		X	
g. Related case information		X																		X	

6.10.3 Requirements

6.10.3.1 Introduction

To realize the benefits outlined in the previous section, the application package will need the support described in the following charts.

6.10.3.2 Supporting Charts

Chart 8 is a matrix which presents the data sets described in detail in Table 5-1 and in general in Appendix B that will be used by the application area tasks described in detail in Section 6.10.1.3.1. The matrix is intended to serve four purposes:

a. To show which data sets are required to execute application area tasks

b. To show how much use is made of a data set by representing the number of tasks within an application area that use the data set.

c. To show how the particular task uses the data in the data set, i.e., just displays the data, (R) adds new data (W) or corrects existing data. (R/W)

The symbols used at the intersections have the following meanings:

P - Indicates that the data in the data set is read, i.e., displayed on a video screen, in a report, etc., but no updating of the data takes place. This is just a visual display of the data for review, auditing, information, etc. For example, the resource specialist would want to examine previous resource surveys in a paticular area before making a field trip. To do this the various resource data sets are interrogated to determine if a resource survey was performed in the desired area and if so, what information was gathered in each resource category. This could be done initially using a video device and if the information is useful a hard copy could be obtained.

W - Indicates that the data set or a logical record is initially created without immediate review. An audit trail or error listing may be produced as a result of this update but no use is made of the updated data set. For example, a large amount of information may be added to a data set which would involve a time consuming effort to enter, edit and correct each transaction.

R/W - Indicates the data set is:

1. Created or updated and then used to produce a product. That is, the resource specialist enters the field collected data into the data set, makes corrections, if necessary, and the new data is displayed in a report.

2. Read and after some analysis data in the set is updated. For example, the resource specialist, prior to a field trip, could be perusing resource information from a resource area and, because of that specialist's knowledge of the area, fill in missing information.

R/* - Indicates that while reading the data in a data set a conflict with information in a second data set is discovered. No corrective action is taken at this time. For example, if the resource specialist was examining URAs in the secialists discipline and a discrepancy was noted with the previously examined resource inventory data, a field trip would be required before the discrepancy could be corrected.

It should be noted that the symbol used represents the most common usage of a data set by a task. This does not mean however that another function cannot be performed. The common procedure may be to read (R) only, but on occasion a write (W) or conflict reduction (R/*) may be done.

Detailed menus for each data set are found in Phase IV of the report.

Chart 8. Tasks vs Data Sets

TASKS	DATA SETS																					
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	MAP/MAP	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
a. Compliance checking										W	R/W	R										
b. Trepass identification											R/W											
c. Billing											R/W		W									

Chart 9 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.10.1.3.1 to data maintained in other application areas and BLM personnel responsible for supplying application input data. The matrix is intended to serve three purposes:

a. To show which other application areas furnish information to the application area task

b. To show the personnel position titles within BLM which are responsible for providing information to the application area task

c. It may indicate critical application area linkages, which would affect the implementation sequence.

Chart 9. Tasks vs Application Area Inputs and Supplier Responsibility

TASKS	APPLICATION AREA INPUTS															SUPPLIERS								
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	EAR/EIS	Regional Analysis	Protection	District Staff	DSC Staff							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15									
a. Compliance									X					X		X								
b. Trespass									X							X								
c. Billing						X			X							X	X							

6.10.4 Application Package Relationships

6.10.4.1 Introduction

While a package is designed to be implemented without automated dependence on other packages, a relationship will still exist. This section will provide the reader with a pictorial portrayal of this relationship.

6.10.4.2 Relationship Chart

Chart 10 is a graphic presentation of package interrelationships. The connecting lines and arrows show the flow of the information and the number associated with the line refers to an explanatory paragraph in Section 6.16.

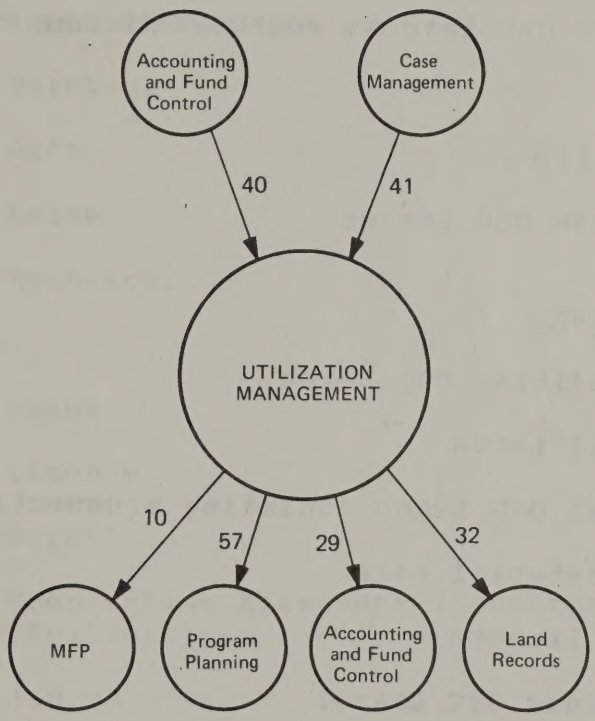

Chart 10. Package Interrelationships

6.10.5 Implementation Options

The Utilization Management Application Package is composed of the following tasks:

a. Compliance Checking

b. Trespass Identification and Processing

c. Notification of Bills due.

In addition, the package can have as source data the following:

a. Minerals:

1. Patent Claim

2. Competitive O&G Lease:

(a) OCS
(b) Upland.

3. Non-Competitive O&G Lease

4. Geothermal Lease

5. Other than O&G Lease including prospecting

6. Mineral material sale

7. Free use license

8. Simultaneous O&G Lease.

b. Land:

1. Sale:

(a) R&PP
(b) Public
(c) Small tract.

2. Desert Land Entry Grant

3. Exchange

4. Lease

5. Permit:

   (a) SLUP
   (b) Rights-of-way.

6. Grants

7. Withdrawal.

c. Land Acquisition:

1. Purchase

2. Gift

3. Lease

4. Exchange.

d. Range:

1. Lease

2. License

3. Permit

4. Cooperative Agreement (Construction and land treatment)

5. J.D.R.

e. Forest:

1. Sale:

   (a) Competitive
   (b) Non-Competitive.

2. Free use permit.

f. Wildlife Habitat:

1. Cooperative agreement

g. Watershed and R.I.:

1. Cooperative agreement

h. Bureau motion J.D.R.

Any mixture of source data types and tasks can be selected and combined for implementation to fit BLM needs. It should be noted that when a particular ADP capability is developed to support any selected implementation, it will then be available to any further implementation efforts which require that capability.

Any combination of sources and tasks that produce a useful product can be selected for implementation. For example; compliance checking of OCS Competitive O&G Leases and Billing of annual Grazing Permits information could be chosen idependently or sequentially for implementation.

Section 6.11 MANPOWER AND ORGANIZATION MANAGEMENT

6.11.1 Introduction

6.11.1.1 Objective

The objective, in this application area, is to provide automated support to attain the Bureau's goals in responding to specific personnel resource needs for manpower and organization program management assistance. This will give BLM the following:

a. Organizational structure manipulation to observe effects of changes, trends, etc.

b. Position analysis to obtain optimum utility

c. Assistance in career development.

6.11.1.2 Tasks

The tasks which will benefit from the implementation of this application package are:

a. Personnel Management:

1. Manpower planning
2. Manpower utilization
3. Personnel management evaluation
4. Employee performance evaluation
5. Personnel records management.

b. Organization management:

1. Planning
2. Structure alteration.

6.11.1.3 Current Situation

6.11.1.3.1 Description

The following descriptions relate, briefly, how the tasks are performed.

a. In the Personnel management area:

1. Manpower Planning:

(a) Determine BLM programs
(b) Determine BLM workload to accomplish the programs:

(1) Current
(2) Projected.

(c) Determine attrition rate
(d) Perform attrition and workload analysis
(e) Evaluate programs by correlating with work force and budget
(f) Formulate personnel policies
(g) Issue personnel policies.

2. Manpower Utilization:

(a) Determine recruitment needs
(b) Examine work force composition
(c) Analyze manpower/correlation
(d) Select qualified personnel
(e) Evaluate training utilization.

3. Personnel Management Evaluation:

(a) Establish cyclical audit program
(b) Conduct interviews with supervisors (cyclical audit)
(c) Assess effectiveness of personnel activities
(d) Evaluate the program.
(e) Report evaluation results.

4. Employee Performance Evaluation:

(a) Conduct appraisal session
(b) Evaluate employee.

5. Personnel Records Management:

(a) Establish employee skills
(b) Record employee training.

b. In the area of Organization management:

1. Planning:

(a) Determine BLM organizational structure at all levels
(b) Evaluate current structure against programs
(c) Recommend changes.

2. Structure Alteration:

(a) Evaluate recommended changes
(b) Initiate change proceedings.

6.11.1.3.2 Problem Areas

Automation will help in solving the following problems:

a. Trying to establish the current work force required to accomplish all of BLM's program is complex and requires a lot of analysis and planning. Projecting these requirements is even harder. Added complicating factors are attrition and policy changes.

b. Making good use of the personnel on hand plus anticipating recruitment needs, projected personnel needs and selecting qualified individuals is difficult and time-consuming.

c. Personnel programs need constant monitoring and evaluation to ensure the BLM employee are receiving the necessary service from them. This is a time-consuming task.

d. Keeping the personnel records current on all 4,500 BLM employees as to skills and training is a day-to-day, time-consuming job.

e. The various BLM organizational structures must be viable in order to be able to adjust to the changing environmental demands and uses.

6.11.1.3.3 Supporting Charts

Chart 1 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.11.1.3.1 to the problems identified in Section 6.11.1.3.2. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which problem areas

b. To show how widespread a problem is by presenting the number of application area tasks affected by that problem

c. Assuming that the more widespread a problem the higher priority for solution, it can be used as the basis for determining a schedule for implementing solutions.

PROBLEMS / TASKS	a. Work force requirements	b. Good use of personnel	c. Program monitoring	d. Personnel record currency	e. Viable organizational structure							
a. Personnel management												
1. Manpower planning	X	X										
2. Manpower utilization	X	X										
3. Personnel management evaluation			X									
4. Employee performance evaluation				X								
5. Personnel records management				X								
b. Organization management												
1. Planning	X	X			X							
2. Structure alteration	X	X			X							

Chart 1. Problems vs Tasks

Chart 2 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.11.1.3.1 to the current BLM ADP support systems. The matrix is intended to show which application area tasks are currently supported in any degree by automation.

TASKS / CURRENT ADP SUPPORT SYSTEMS	a. Personnel Management					b. Organization Management							
	1. Manpower planning	2. Manpower utilization	3. Personnel management evaluation	4. Employee performance evaluation	5. Personnel Records management	1. Planning	2. Structure Alteration						
Manpower - Personnel	X	X				X	X						
EXIR	X	X	X			X							

Chart 2. Problems vs Current ADP Support

The current ADP capabilities are batch oriented only as no interactive capacity exists.

6.11.1.4 ADP Capabilities

6.11.1.4.1 Description

All BLM employees have a personnel jacket. All BLM employees are interested in the personnel programs, training programs, merit incentive progrms, etc. because they are directly effected by them. That is why this is such an important area. Personnel decisions touch every employee and are therefore of vital interest to all employees.

Full automation of this application area will require use of certain ADP capabilities described below.

a. Structured data update, retrieval and output are used in all facets of Manpower and Organization. Manpower Planning uses the retrieval and output capabilities to analysis and bring up-to-date BLM's manpower structure. Personnel Management Evaluation uses the update capability to enter new data gathered from field interviews into the system. Employee Performance Evaluation and Personnel Records use the update capability to bring the employee's records up-to-date. Organization Planning uses the update, retrieval and output capabilities to constantly monitor the organizational structures of the BLM.

b. Special processing is used to project manpower needs, perform attrition analysis, do manpower correlation analysis and structural alteration evaluation analysis.

c. Job execution, batch, will be used to enter selected personnel planning, utilization, evaluation, and organization data into the system as well as display it.

d. Job execution, interactive online, will be used to display various algorithm results.

e. Data base conversion would be used to convert all existing BLM personnel data into the new data base.

6.11.1.4.2 Supporting Charts

Chart 3 is a matrix which presents the relationship of the application area tasks and subtasks described in detail in Section 6.11.1.3.1 to the required ADP capabilities identified, specifically, in Section 6.11.1.4.1 and, generally Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required to support the application area tasks and subtasks

b. To show which ADP capabilities provide the most support throughout the application area

c. Assuming the more tasks associated with an ADP capability associated with the greater the need for its development, it can be used as a basis for determining a schedule for development.

Chart 3. ADP Capabilities vs Tasks

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing				Image Processing					Computer Assisted Training					Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition	Special Processes	Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local	Data Base Conversion	Microfilm	Interactive Online	Batch	
a. Personnel management																					
1. Manpower planning																					
(a) Determine BLM programs		X															X			X	
(b) Determine BLM workload:																					
(1) current		X																	X		
(2) projected									X										X		
(c) Determine attrition rate		X																	X		
(d) Perform attrition analysis									X										X		
(e) Perform workload analysis									X										X		
(f) Evaluate programs									X										X		
(g) Formulate personnel policy																					
(h) Issue personnel policy																					
2. Manpower utilization																					
(a) Determine recruitment needs		X															X			X	
(b) Examine workforce composition		X																		X	
(c) Analyze manpower correlation									X										X		
(d) Select qualified personnel	X																			X	
(e) Evaluate training utilization									X										X		
3. Personnel management evaluation																					
(a) Establish cyclical audit	X																			X	
(b) Conduct interviews	X																X			X	
(c) Assess effectiveness	X																			X	
(d) Evaluate	X																			X	
(e) Report evaluation		X																		X	
4. Employee performance evaluation																					
(a) Conduct appraisal session	X																X			X	
(b) Evaluate employee	X																			X	
5. Personnel records management																					
(a) Establish employee skills	X																X			X	
(b) Record employee training	X																			X	

Chart 3. ADP Capabilities vs Tasks (Continued)

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
b. Organization management																					
1. Planning																					
(a) Determine organizational structure		X							X								X			X	
(b) Evaluate against programs									X										X		
(c) Recommend changes	X																		X		
2. Structure alteration																					
(a) Evaluate recommendations									X										X		
(b) Initiate change proceedings	X																X		X		

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Chart 4 is a matrix which presents the relationship of the required ADP capabilities described in detail in Section 6.11.1.4.1 and generally in Appendix A to the problems identified in Section 6.11.1.3.2. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are needed to help solve the problems in the application area

b. To show which ADP capabilities provide the most support, i.e., help solve the most problems

c. Assuming the more problems solved by an ADP capability the greater the need, it can be used as the basis for determining a schedule for development.

Chart 4. ADP Capabilities vs Problems

PROBLEMS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Work force requirements:																					
1. Current		X																		X	
2. Projected									X										X		
b. Good use of personnel:																					
1. On hand		X																		X	
2. Recruitment needs									X										X		
3. Projected									X										X		
c. Personnel program:																					
1. Monitor		X																	X		
2. Evaluate									X										X		
3. Upgrade	X																		X		
d. Personnel record currency	X																		X		
e. Viable organization structure																					
1. Adjustable	X																		X		
2. Monitor		X																	X		
3. Compare to mission									X										X		

6.11.2 Benefits

6.11.2.1 Introduction

The benefits of applying specified ADP capabilities to problems in the current BLM situation can be described in terms of:

a. Up-to-date personnel data

b. A visible, viable organizational structure that is suitably matched against programs

c. Better use of personnel.

6.11.2.2 Detailed Benefits

a. Continuation, with enhancement, of these current ADP-supported BLM systems:

1. Manpower/correlation analysis
2. Position evaluation
3. Performance evaluation
4. In-grade increase monitoring
5. Personnel training records
6. Personnel reports
7. Personal skills
8 Specially qualified consultants.

b. ADP can assist in forecasting recruitment needs, based on attrition analysis, to provide uninterrupted, efficient execution of Bureau programs (cadastral, forestry, etc.) Currently this manual task is difficult, time-consuming and not effective.

c. ADP can be used to summarize questionnairs used in cyclical audits of position and personnel program evaluations. This is currently a very time-consuming manual tasks.

d. Increased timeliness and usefulness of personnel reports for managers and employees will be realized by all BLM offices having more direct access to autommated manpower data.

e. ADP will assist in the correlation of the work force to current and planned BLM programs. Currently a very difficult and time-consuming task.

f. When the organizational structure changes, with the help of the computer, BLM will be able to determine manpower requirements, placement and current location.

6.11.2.3 Supporting Charts

Chart 5 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.11.1.3.1 to the anticipated benefits identified in Section 6.11.2 and the output products. The matrix is intended to serve four purposes:

a. To provide a list of the generic products associatedwith a task.

b. To show the anticipated benefits associated with a particular task.

c. Assuming that the more anticipated benefits associated with a task the greater the gain to BLM, it can be used as the basis for determining a schedule for implementation

d. To show how widespread a benefit is by presenting the number of application area tasks affected by the benefit.

TASKS	PRODUCTS	BENEFITS											
		a. Enhance current support	b. Forecast recruitment needs	c. Cyclical audits	d. Direct access to ADP	e. Work force correlation	f. Organizational structural changes						
a. Personnel Management													
1. Manpower Planning	• Attrition analysis • Workload analysis • Recruitment needs • Manpower/correlation analysis • Employee assignment	X	X		X	X	X						
2. Manpower Utilization	• Recruitment needs • Manpower/correlation analysis • Employee assignment												
3. Personnel Management Evaluation	• Personnel management evaluation • Position evaluation • Training evaluation	X		X	X								
4. Employee Performance Evaluation	• Employee performance evaluation				X								
5. Personnel Records Management	• Attrition Analysis • Workload Analysis • Recruitment needs • Position evaluation • Training evaluation • Employee performance evaluation • Employee assignment	X			X	X							

Chart 5. Tasks vs Products and Benefits

TASKS	PRODUCTS	BENEFITS											
		a. Enhance current support	b. Forecast recruitment needs	c. Cyclical audits	d. Direct access to ADP	e. Work force correlation	f. Organizational structural changes						
b. Organization Management													
1. Planning	Organization Chart (T00) Employee assignment		X		X	X	X						
2. Structure Alteration	Organization Chart (T00) Employee assignment				X	X	X						

Chart 5. Tasks vs Products and Benefits (Continued)

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Chart 6 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.11.1.3.1 to the potential BLM users of products generated when the task is automated. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which users

b. To show how many users will receive products from automation of the particular task

c. Assuming that the more anticipated users, the higher the priority for implementation, it can be used as a basis for determining an implementation schedule.

USERS / TASKS	District Admin.	District Managers	State Admin.	State Managers	Special Office Admin.	Special Office Mgmt.	Hq. Admin.	Hq. Mgmt.	DSC Staff			
a. Personnel Management												
1. Manpower planning		X		X		X		X	X			
2. Manpower utilization		X		X		X		X	X			
3. Personnel management evaluation									X			
4. Employee performance evaluation		X		X		X		X				
5. Personnel records management	X		X		X		X		X			
b. Organization management												
1. Planning	X		X		X		X					
2. Structure alteration		X		X		X		X	X			

Chart 6. Tasks vs User

Chart 7 is a matrix which presents the relationship of the anticipated benefits described in detail in Section 6.11.2 to the required ADP capabilities identified specifically in Section 6.11.1.4.1 and generally in Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required by this application area to realize the anticipated benefits

b. To show which ADP capabilities provide the most support in terms of the number of benefits associated with a particular ADP capability

c. Assuming the more anticipated benefits associated with an ADP capability the greater the need for the capability, it can be used as the basis for determining a development schedule.

Chart 7. Benefits vs ADP Capabilities

BENEFITS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing				Image Processing					Computer Assisted Training				Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition	Special Processes	Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local	Data Base Conversion	Microfilm	Interactive Online	Batch	
a. Enhance current support	X	X							X										X		
b. Forecast recruitment needs									X										X		
c. Cyclical audits:																					
1. Update	X																		X		
2. Summarize									X										X		
d. Direct access to ADP		X																	X		
e. Work force correlation:																					
1. Current programs		X																	X		
2. Planned programs									X										X		
f. Organizational structure:																					
1. Changes	X																		X		
2. Analysis									X										X		

6.11.3 Requirements

6.11.3.1 Introduction

To realize the benefits outlined in the previous section, the application package will need the support described in the following charts.

6.11.3.2 Supporting Charts

Chart 8 is a matrix which presents the data sets described in detail in Table 5-1 and in general in Appendix B that will be used by the application area tasks described in detail in Section 6.11.1.3.1. The matrix is intended to serve four purposes:

a. To show which data sets are required to execute application area tasks

b. To show how much use is made of a data set by representing the number of tasks within an application area that use the data set.

c. To show how the particular task uses the data in the data set, i.e., just displays the data, (R) adds new data (W) or corrects existing data. (R/W)

The symbols used at the intersections have the following meanings:

R - Indicates that the data in the data set is read, i.e., displayed on a video screen, in a report, etc., but no updating of the data takes place. This is just a visual display of the data for review, auditing, information, etc. For example, the resource specialist would want to examine previous resource surveys in a paticular area before making a field trip. To do this the various resource data sets are interrogated to determine if a resource survey was performed in the desired area and if so, what information was gathered in each resource category. This could be done initially using a video device and if the information is useful a hard copy could be obtained.

W - Indicates that the data set or a logical record is initially created without immediate review. An audit trail or error listing may be produced as a result of this update but no use is made of the updated data set. For example, a large amount of information may be added to a data set which would involve a time consuming effort to enter, edit and correct each transaction.

R/W - Indicates the data set is:

1. Created or updated and then used to produce a product. That is, the resource specialist enters the field collected data into the data set, makes corrections, if necessary, and the new data is displayed in a report.

2. Read and after some analysis data in the set is updated. For example, the resource specialist, prior to a field trip, could be perusing resource information from a resource area and, because of that specialist's knowledge of the area, fill in missing information.

R/* - Indicates that while reading the data in a data set a conflict with information in a second data set is discovered. No corrective action is taken at this time. For example, if the resource specialist was examining URAs in the secialists discipline and a discrepancy was noted with the previously examined resource inventory data, a field trip would be required before the discrepancy could be corrected.

It should be noted that the symbol used represents the most common usage of a data set by a task. This does not mean however that another function cannot be performed. The common procedure may be to read (R) only, but on occasion a write (W) or conflict reduction (R/*) may be done.

Detailed menus for each data set are found in Phase IV of the report.

Chart 8. Tasks vs Data Sets

TASKS	DATA SETS																				
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	Program Plans	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
a. Personnel Management																						
1. Planning														R	R/W							
2. Utilization															R/W							
3. Personnel Management Evaluation															R/W							
4. Personnel Employee Evaluation															R/W	R/W						
5. Personnel Records															R/W	R						
b. Organization Management																						
1. Planning															R/W							
2. Structure Alterations															R/W							

Chart 9 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.11.1.3.1 to data maintained in other application areas and BLM personnel responsible for supplying application input data. The matrix is intended to serve three purposes:

a. To show which other application areas furnish information to the application area task

b. To show the personnel position titles within BLM which are responsible for providing information to the application area task

c. It may indicate critical application area linkages, which would affect the implementation sequence.

Chart 9. Tasks vs Application Area Inputs and Supplier Responsibility

TASKS	APPLICATION AREA INPUTS															SUPPLIERS							
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	Protection	Regional Analysis	EAR/EIS	All BLM Offices							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15								
a. Personnel Management																							
1. Planning																X							
2. Utilization																X							
3. Personnel Management Evaluation																X							
4. Employee Performance Evaluation																X							
5. Personnel Records																X							
b. Organization Management																							
1. Planning																X							
2. Structure Alterations																X							

6.11.4 Application Package Relationships

6.11.4.1 Introduction

While a package is designed to be implemented without automated dependence on other packages, a relationship will still exist. This section will provide the reader with a protrayal of this relationship.

6.11.4.2 Relationship Chart

Chart 10 is a graphic presentation of package interrelationships. The connecting lines show the flow of the information and the number associated with the line refers to any explanatory paragraph in Section 6.16.

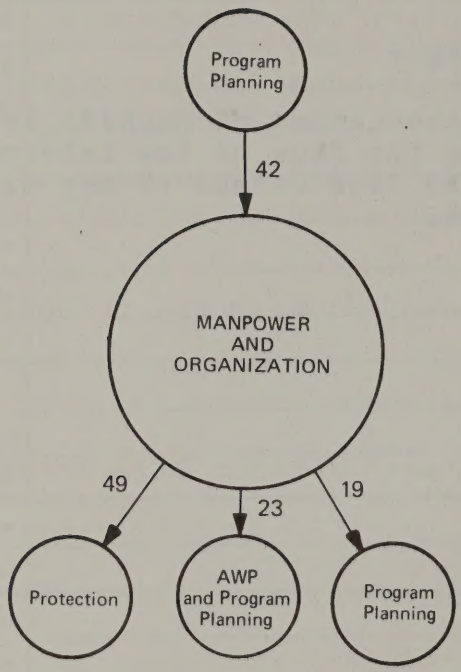

Chart 10. Package Interrelationships

6.11.5 Implementation Options

Conversion of existing personnel data files to the new files and the conversion of the organization data to a form acceptable to ADP are the order in which it is recommended that implementation take place.

6.12 PROPERTY CONTROL AND MANAGEMENT

6.12.1 Introduction

6.12.1.1 Objective

The objective, in this application area, is to provide automated support in the management and control of real and personal property. This will give BLM the following:

a. New capabilities and enhancements to existing automated support

b. Assist in the most efficient and least costly acquisition, utilization and maintenance of personal and real property

c. Better control of existing real and personal property.

6.12.1.2 Tasks

a. The tasks which will benefit from implementation of this application package in the area of Personal Property Management are:

   1. Stores and equipment inventory and control

   1. Stores and equipment utilization and maintenance.

b. Tasks supported in the area of Real Property Management are:

   1. Real property accountability

   2. Real property utilization

   3. Real property maintenance.

6.12.1.3 Current Situation

6.12.1.3.1 Description

a. In the personal property area:

1. Stores and equipment inventory and control is accomplished by initially recording data at the time it is acquired on stores property cards and subsequently updating these cards. Issues and returns are also maintained on standard forms and a stores control register. Review reports are summarized onto a document face sheet.

2. Stores and equipment maintenance requires the recording and processing of utilization and maintenance information to develop repair or replacement requirements and maintenance schedules.

b. In the real property area:

1. Real property accountability is initiated by the responsible officer submitting real property record forms for buildings, structures, facilities or land to DSC. DSC, in turn, assigns real property numbers and maintains a master record by that number.

2. Real property utilization is performed annually to determine to what extent the property is being utilized. This evaluation process results in a report describing necessary adjustments which strive towards optimum utilization.

3. Real property maintenance currently is associated with development and monitoring of maintenance schedules in the areas of buildings and recreation sites, roads and trails, and communications equipment.

(a) Buildings and recreation sites -- Maintenance inspection checklists and maintenance summary forms are used to compile and evaluate data for eventual input into the Annual Work Plan.

(b) Roads and trails -- Data is compiled and evaluated for inut into the Annual Work Plan from:

(1) maintenance inventory - roads

(2) Inventory and maintenance schedules - trails.

(c) Communications -- Maintenance status information on communications equipment is recorded on a report form that is continuously updated until disposal of the equipment.

6.12.1.3.2 Problem Areas

a. The inventory records of stores and equipment are scattered among all Bureau offices. The information is placed in file cabinet folders, accountability ledgers and DSC. The BLM uses this information for capitalizing personal property. While these records are maintained accurately, with each office accounting for the description, location and utilization of this equipment, the main problem seems to be the inability to quickly reference this data, especially when stores and equipment records are required from several offices. Also a problem is encountered in requesting selective equipment information. Much more data is received than is desired requiring manual searches through extraneous data. An example would be the need to borrow range land drill equipment. It is a tedious task to track down where this type of equipment is located, it's availability, and a description as to the type and present condition.

b. The paperwork required to record stores and equipment identification, value, accountability information, maintenance requirements, etc., is necessary. Maintaining duplicate records is necessary but this compounds the work load of recording and storing this information. Then, keeping the information identical in duplicate records is very difficult. This problem is the result of a need to keep this information at a particular office as well as reporting this information to other offices or the Denver Service center. Here the

main problem is the lack of a single repository for all equipment and stores inventory information.

c. Utilization determination as well as maintenance (replacement or repair) determination, scheduling and schedule monitoring is a problem. Utilization of vehicles, for instance, can be determined using the existing recorded use information of a particular vehicle, however, this is done manually and is difficult to see past trends for all vehicles within a district. Equipment maintenance schedule target dates can easily go undetected by managers not having the time, due to their workload, to periodically review the maintenance status of the total stores and equipment inventory under his responsibility.

d. Real property records are fragmented in that maintenance requirements data is separated from the accountability data. Cross referencing real property with personal property when it is associated with a building or trail is difficult. Many examples of this type of a problem were related by the field. Field people stated the need to inventory recreation site building, condition, fixtures, sewage disposals, etc. Other managers required information on road construction history, the surface type and its need for maintenance.

An Automated Road Inventory exists for 47,000 miles of road but manipulation and selective extraction of this data is a problem. In addition a bridge inventory also exists but it cannot be plotted on the present Automated Road Inventory. There also exists a need to identify and classify maintenance status on 4000 to 5000 acquired bridges.

In Oregon, 2000 road segments exist on 2000 separate records; manipulation of these records is laborious.

e. The Boise Interagency Fire Control facility has unique problems in property management:

1. In the area of warehouse inventory control BLFC has developed an automated control system to relieve many of their problems.

2. Unacceptable delays are still encountered in turn around time through DSC in preparing stores journal vouchers required to reconcile stores account.

6.12.1.3.3 Supporting Charts

Chart 1 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.12.1.3.1 to the problems identified in Section 6.12.1.3.2. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which problem areas

b. To show how widespread a problem is by presenting the number of application area tasks affected by that problem

c. Assuming that the more widespread a problem the higher priority for solution, it can be used as the basis for determining a schedule for implementing solutions.

PROBLEMS / TASKS	a. Locating stores and equipment	b. Duplication of records	c. Utilization determination	d. Real property location	e. Preparation of stores journal vouchers							
a. Stores and Equipment												
1. Inventory and Control	X				X							
2. Utilization and Maintenance		X	X									
b. Real Property												
1. Accountability				X								
2. Utilization			X	X								
3. Maintenance			X	X								

Chart 1. Problems vs Tasks

Chart 2 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.12.1.3.1 to the current BLM ADP support systems. The matrix is intended to show which application area tasks are currently supported in any degree by automation.

TASKS / CURRENT ADP SUPPORT SYSTEMS	a. Stores and Equipment		b. Real Property										
	1. Inventory Control	2. Utilization Maintenance	1. Inventory	2. Utilization	3. Maintenance								
Motor Vehicle	X	X											
Roads and Trails Inventory			X	X	X								
Property Management			X										
Warehouse Inventory Control	X												

Chart 2. Problems vs Current ADP Support

6.12.1.4 ADP Capabilities

6.12.1.4.1 Description

The capability to directly enter property inventory, utilization and maintenance information and selectively retrieve this information at a user's normal work location would greatly increase the usefulness of property data. Therefore it is recommended that the structured data handling update, predefined and ad hoc retrieval/output capabilities be developed. The special processing capability would be developed in support of real property maintenance scheduling, schedule monitoring, etc.

The ADP capabilities that are necessary to perform the tasks previously described are listed below along with a short description of what the capabilities will provide.

a. Structured data handling:

   1. Update -- necessary to store personal and real property data elements into the appropriate data set.

   2. Predefined Retrieve/Output -- required to access complete or partial property records for reference, utilization/maintenance determination and scheduling.

   3. Ad hoc retrieval/output required to display stores, equipment and real property data in an impromtu manner.

b. Special processing -- necessary to evaluate utilization, generate maintenance schedules, periodically perform status checks and produce maintenance reminders.

c. Job execution:

   1. Interactive online -- necessary to respond to requests for ad hoc retrievals and updates of stores, equipment and real property information.

2. Batch -- required to process infrequent requests for summary utilization or maintenance schedule reports.

d. Data base conversion would be used to convert the real and personal property data into the new data base.

6.12.1.4.2 Supporting Charts

Chart 3 is a matrix which presents the relationship of the application area tasks and subtasks described in detail in Section 6.12.1.3.1 to the required ADP capabilities identified, specifically, in Section 6.12.1.4.1 and, generally Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required to support the application area tasks and subtasks

b. To show which ADP capabilities provide the most support throughout the application area

c. Assuming the more tasks associated with an ADP capability associated with the greater the need for its development, it can be used as a basis for determining a schedule for development.

Chart 3. ADP Capabilities vs Tasks

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing				Image Processing					Computer Assisted Training				Job Execution		Comments
		Retrieval/ Output																			
	Update	Pre-defined	Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition	Special Processes	Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local	Data Base Conversion	Microfilm	Interactive Online	Batch	
a. Stores and Equipment																					
1. Inventory and control:																					
(a) record property information	X																X		X		
(b) reference property information			X																X		
(c) generate reports		X																		X	
2. Utilization and maintenance:																					
(a) report utilization and maintenance	X																X		X		
(b) determine utilization and maintenance			X						X											X	
b. Real Property																					
1. Accountability:																					
(a) record property information																	X			X	
(b) reference property information			X																X		
(c) generate reports		X																			
2. Utilization:																					
(a) report utilization	X																X				
(b) determine utilization			X						X											X	
3. Maintenance:																					
(a) develop schedule	X								X								X			X	
(b) monitor schedule									X												

Chart 4 is a matrix which presents the relationship of the required ADP capabilities described in detail in Section 6.12.1.4.1 and generally in Appendix A to the problems identified in Section 6.12.1.3.2. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are needed to help solve the problems in the application area

b. To show which ADP capabilities provide the most support, i.e., help solve the most problems

c. Assuming the more problems solved by an ADP capability the greater the need, it can be used as the basis for determining a schedule for development.

Chart 4. ADP Capabilities vs Problems

ADP CAPABILITIES / PROBLEMS	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Locating stores and equipment		X	X																X		
b. Duplication of records	X																		X		
c. Utilization determination																					
1. Available		X																	X		
2. Schedule									X											X	
d. Real property location		X	X																X		
e. BIFC																					
1. Warehouse inventory		X																	X		
2. Stores journal vouchers		X																	X		

6.12.2 Benefits

6.12.2.1 Introduction

The benefits of applying specified ADP capabilities to problems in the current BLM situation can be described in terms of:

a. More immediate and selective access to property record information

b. Reduced property management paperwork

c. Added flexibility to quickly assemble mixed personal and real property information

d. Added flexability to quickly assemble mixed attribute data, such as accountability, with required maintenance information, etc.

6.12.2.2 Detailed Benefits

The benefits derived from the implementation of automation to support the tasks included in this application package are:

a. A reduction of the time interval between the initial request for selective or summarized property information and final receipt of such information, will be realized. The automated system would have all property record information at its disposal to rapidly extract only that composite information requested. Present time delays are encountered since managers and staff personnel must request file cabinet searches, telephone calls to other offices, special computer runs for part of the information, etc. Since several or even dozens of people may get involved in extracting selective limited information, not only is there time delays involved but also significant manpower expended in gathering this information.

b. A reduction in property recording forms, cuff records of information passed on to DSC or other offices and other paperwork associated with accountability, utilization and maintenance of personal and real property. The

automated system would allow direct data entries from District, State, DSC, OCS and Washington office locations. By using prompting and format guiding techniques the automated system would unburden the person making the entry. Currently, the information is recorded on a wide variety of existing forms.

c. Additional capabilities, would be provided through the capacity of correlating or associating stores and equipment properties with real property. Rapid search of both the real property records and the personal property records would be possible, allowing combined or aggregated summaries of such items as building location, fixtures, equipment, assigned vehicles contained in or assigned to this particular facility or all bridges associated with a series of road segments.

d. Peduction of time and resultant expended manpower, to retrieve dissimilar yet strongly associated accountability, utilization and maintenance or replacement data elements of a particular property. By having all attribute data within a single logical record for a particular equipment item, building, road, recreation site, etc., the user could access only those selective items from the total record.

e. Implementing a warehouse inventory control subsystem to one or more BLM locations having a justifiable need for such a capability. Once the existing warehouse control subsystem at BIFC is integrated into the overall BLM automated system, this already developed subsystem could be implemented at other BLM locations. The only major expense being any unique hardware required by this subsystem.

f. Increased efficiency in determining property utilization, developing maintenance and repair schedules, and monitoring these schedules will be realized. The automated system, having the total property record information available, would rapidly summarize utilization information to assist managers in optimizing the use of property types and developing maintenance schedules. The system would monitor these schedules and issue reminders to managers of those equipments, buildings, roads, etc. requiring maintenance

in the near future, as well as those properties whose scheduled maintenance dates had been exceeded with no maintenance activity recorded.

6.12.2.3 Supporting Charts

Chart 5 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.12.1.3.1 to the anticipated benefits identified in Section 6.12.2 and the output products. The matrix is intended to serve four purposes:

a. To provide a list of the generic products associatedwith a task.

b. To show the anticipated benefits associated with a particular task.

c. Assuming that the more anticipated benefits associated with a task the greater the gain to BLM, it can be used as the basis for determining a schedule for implementation

d. To show how widespread a benefit is by presenting the number of application area tasks affected by the benefit.

TASKS	PRODUCTS	BENEFITS											
		a. Access to property record	b. Reduced paperwork	c. Assemble real and personnel property data	d. Assemble mixed attribute data	e. Warehouse system	f. Increased efficiency						
a. Stores and Equipment													
1. Inventory control	• Listing of current property inventory acquisition, utilization and maintenance information • Issue/returns/current level reports	X	X	X	X	X	X						
2. Utilization/ Maintenance	• Listing of current property inventory acquisition, utilization and maintenance information • Maintenance/replacement schedule • Utilization reports	X	X				X						
b. Real Property													
1. Accountability	• Listing of current property inventory acquisition, utilization and maintenance information	X	X	X	X	X	X						
2. Utilization	• Listing of current property inventory acquisition, utilization and maintenance information • Utilization reports	X			X		X						
3. Maintenance	• Listing of current property inventory acquisition, utilization and maintenance information • Maintenance/replacement schedule	X	X				X						

Chart 5. Tasks vs Products and Benefits

Chart 6 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.12.1.3.1 to the potential BLM users of products generated when the task is automated. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which users

b. To show how many users will receive products from automation of the particular task

c. Assuming that the more anticipated users, the higher the priority for implementation, it can be used as a basis for determining an implementation schedule.

USERS / TASKS	DSC Property Management		District Administration		State, OCS, BIFC, & Mgmt Services		Hq. Admin. Services					
	Staff	Manager	Staff	Manager	Staff	Manager	Staff	Manager				
a. Stores and Equipment												
1. Inventory and Control	X	X	X	X	X							
2. Utilization and Maintenance		X		X	X	X	X					
b. Real Property												
1. Accountability	X	X		X		X	X	X				
2. Utilization	X	X		X		X	X	X				
3. Maintenance	X	X	X		X		X					

Chart 6. Tasks vs User

Chart 7 is a matrix which presents the relationship of the anticipated benefits described in detail in Section 6.12.2 to the required ADP capabilities identified specifically in Section 6.12.1.4.1 and generally in Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required by this application area to realize the anticipated benefits

b. To show which ADP capabilities provide the most support in terms of the number of benefits associated with a particular ADP capability

c. Assuming the more anticipated benefits associated with an ADP capability the greater the need for the capability, it can be used as the basis for determining a development schedule.

Chart 7. Benefits vs ADP Capabilities

BENEFITS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Access to property records			X																X		
b. Reduced paperwork	X																		X		
c. Assemble real and personal property			X																X		
d. Assemble mixed attribute data			X																X		
e. Warehouse system																					
1. Update	X																			X	
2. Review		X																	X		
f. Increased efficiency									X										X		

6.12.3 Requirements

6.12.3.1 Introduction

To realize the benefits outlined in the previous section, the application package will need the support described in the following charts.

6.12.3.2 Supporting Charts

Chart 8 is a matrix which presents the data sets described in detail in Table 5-1 and in general in Appendix B that will be used by the application area tasks described in detail in Section 6.12.1.3.1. The matrix is intended to serve three purposes:

a. To show which data sets are required to execute application area tasks

b. To show how much use is made of a data set by representing the number of tasks within an application area that use the data set.

c. To show how the particular task uses the data in the data set, i.e., just displays the data, (R) adds new data (W) or corrects existing data. (R/W)

The symbols used at the intersections have the following meanings:

R - Indicates that the data in the data set is read, i.e., displayed on a video screen, in a report, etc., but no updating of the data takes place. This is just a visual display of the data for review, auditing, information, etc. For example, the resource specialist would want to examine previous resource surveys in a paticular area before making a field trip. To do this the various resource data sets are interrogated to determine if a resource survey was performed in the desired area and if so, what information was gathered in each resource category. This could be done initially using a video device and if the information is useful a hard copy could be obtained.

W - Indicates that the data set or a logical record is initially created without immediate review. An audit trail or error listing may be produced as a result of this update but no use is made of the updated data set. For example, a large amount of information may be added to a data set which would involve a time consuming effort to enter, edit and correct each transaction.

R/W - Indicates the data set is:

1. Created or updated and then used to produce a product. That is, the resource specialist enters the field collected data into the data set, makes corrections, if necessary, and the new data is displayed in a report.

2. Read and after some analysis data in the set is updated. For example, the resource specialist, prior to a field trip, could be perusing resource information from a resource area and, because of that specialist's knowledge of the area, fill in missing information.

R/* - Indicates that while reading the data in a data set a conflict with information in a second data set is discovered. No corrective action is taken at this time. For example, if the resource specialist was examining URAs in the secialists discipline and a discrepancy was noted with the previously examined resource inventory data, a field trip would be required before the discrepancy could be corrected.

It should be noted that the symbol used represents the most common usage of a data set by a task. This does not mean however that another function cannot be performed. The common procedure may be to read (R) only, but on occasion a write (W) or conflict reduction (R/*) may be done.

Detailed menus for each data set are found in Phase IV of the report.

Chart 8. Tasks vs Data Sets

TASKS	DATA SETS																					
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	Program Plans	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
a. Stores and Equipment																						
1. Inventory Control													R/W				R/W					
2. Utilization and Maintenance													R/W				R/W					
b. Real Property																						
1. Accountability													R/W				R/W					
2. Utilization																	R/W					
3. Maintenance													R/W				R/W					

Chart 9 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.12.1.3.1 to data maintained in other application areas and BLM personnel responsible for supplying application input data. The matrix is intended to serve three purposes:

a. To show which other application areas furnish information to the application area task

b. To show the personnel position titles within BLM which are responsible for providing information to the application area task

c. It may indicate critical application area linkages, which would affect the implementation sequence.

Chart 9. Tasks vs Application Area Inputs and Supplier Responsibility

TASKS	APPLICATION AREA INPUTS															SUPPLIERS								
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	Protection	Regional Analysis	EAR/EIS	All Offices								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15								
a. Stores and equipment	Does not require input from other application packages															X								
b. Real property																X								

6.12.4 Application Package Relationships

6.12.4.1 Introduction

While a package is designed to be implemented without automated deperdence on other packages, a relationship will still exist. This section will provide the reader with a pictorial portrayal of this relationship.

6.12.4.2 Relationship Chart

Chart 10 is a graphic presentation of application package inter-relationships. The connecting lines show the flow of the information and the number associated with the line refers to an explanatory paragraph in Section 6.16.

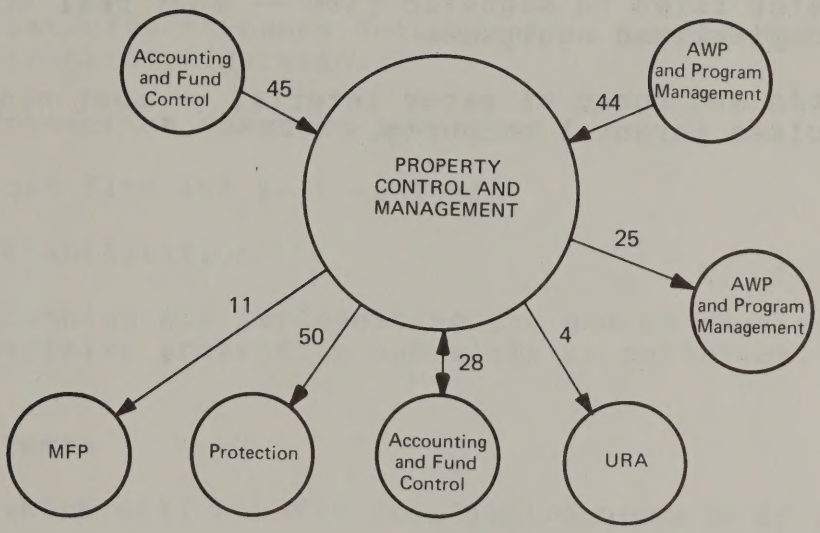

Chart 10. Package Interrelationships

6.12.5 Implementation Options

The categories of data which may be chosen for implementation are:

a. Real property

b. Personal property.

The form in which these catagories of data exist are:

a. Computer files on magnetic tape -- most real property and capitalized equipment

b. Records and forms of paper material -- most stores and non-class personal property.

6.13 PROTECTION

6.13.1 Introduction

6.13.1.1 Objective

The objecive of this application area is to provide automated support to the attainment of the Bureau's goals in the area of fire and pest control. Primary consideration will be given to:

a. Cost/effectiveness determination as related to initial attack configurations.

b. Protection resurces inventory

c. Post fire and pest analysis

d. Rehabilitation

e. Planning and implementing the use of pesticides to maximize protection and minimize pollution.

6.13.1.2 Tasks

The tasks which will benefit from implementation of this package are:

a. Preliminary Analysis
b. Prevention
c. Presuppression
d. Suppression
e. Rehabilitation.

6.13.1.3 Current Situation

6.13.1.3.1 Description

a. Tasks in the preliminary analysis area are:

1. Determine costs in terms of protection personnel and equipment and dollar value for proposed initial attack force configuration.

   Initial attack configuration, which will be specified in the Normal Fire Year plan, are compiled estimates of crew salaries, fuel, equipment, transportation, stores and other costs. Baseline, cost data for each category of resource is accummulated from a wide variety of salary reference documents, stores and equipment records, etc.

2. Evaluate the effectiveness of alternative initial attack force configurations as well as existing or proposed configurations.

   Effectiveness of initial attack configurations is extremely difficult to evaluate objectively. There is a great reliance on effectiveness determined for actual configurations implemented in the past.

3. Weigh the benefits of control against the environmental, economic and social values threatened.

4. Evaluate the relative merits of various possible courses of action.

5. Coordinate all actions with appropriate agencies, i.e. Agricultural Research Services, State Game and Fish Departments, BIFC, etc.

6. Review proposed programs and actions with the public where possible.

b. Tasks in the prevention area are:

   1. Keep inventories of stores, equipment, and fire fighting and pest control crews.

      Inventory data on protection resources such as fire fighting personnel, fire-kit stores, air and land vehicle and fire fighting equipment, etc., are

gathered from a wide variety of records for each category of resource.

2. Develop hazard maps and hazard area sign and posting plans.

   Hazard assessment reduction and control are performed by District personnel analyzing areas that could be potential hazard areas such as areas having a history of fire or pest infestation, conservation of stored fuels, flash fuels or debris adjacent to sawmills, powerlines, pipelines, right-of-ways, etc. Hazard reduction activities are implemented and the resource area fire preventation plan is developed. Hazard maps and sign and posting plans are developed/implemented to control activities in and around these areas.

c. In the presuppression area:

   1. Determine resources commitment by reviewing weather factors, potential damage values, available air and land transportation, equipment, crews, etc.

   2. To determine the extent of resources to be committed to a fire or pest control operation BLM managers gather information on all resources, in determining availability, location, quantities, etc. This information is completed using many sources and is time consuming to collect.

d. In the suppression area:

   1. Assess damage and effectiveness by determining physical damage costs and the cost incurred during suppression. Also, evaluate the effectiveness of committed resources.

   2. Assessment of damage is performed by computing acreage, areas damaged and determining structures and land resources lost then recording and reporting this information. Effectiveness is measured by reviewing and evaluating services rendered, equipment utilized and other support required in the suppression of a fire.

e. In the rehabilitation area:

1. Determine rehabilitation needs of land natural resources damaged.

2. Rehabilitation needs are determined by reviewing the asserted damage and developing the requirements for rehabilitation. The availability of seed, protective fencing, etc., is determined by collecting this current status information from many sources.

6.13.1.3.2 Problem Area

The problems associated with the protection tasks, as they are currently performed, are:

a. It has taken several years to prepare the initial Normal Fire Year Plan (NFYP) and it is anticipated to take one year to generate a new plan. The preliminary analysis task of cost/effectiveness determination comprises the major workload involved in development of the NFYP. Since this task is performed manually, the time and manpower expenditures required are excessive.

b. The workload involved in preparing the NFYP has prevented the thorough evaluation of alternate methods for economically providing the desired level of protection. A similar problem is encountered in the preparation of the pest control program.

c. There are no objective methods for evaluating the effectiveness of alternate approaches or for evaluating the effectiveness of the existing forces in meeting BLM fire and pest control objectives.

d. There is no objective method for determining the need for the revision of a NFYP or pest control program.

e. At BIFC there is a need to support the Logistics Coordinating Center for fire fighting. This requires current information on available pilots, firefighters, crews, aircraft and fuel, kits, supplies, equipment, etc. available in the U.S. for any given fire. The

sixty BLM districts also require this information on a more local basis. The present method of collecting and compiling protection resources information is manual and requires manpower that could be better utilized in making cost conscious decisions such as the commitment level of fire fighting resources to be dispatched.

f. In responding to suppression activities time delays are encountered due to logistics, manpower, etc. information not being readily accessible to the protection managers. Current availability and status of personnel, equipment and other resources must be gathered manually by telephone contact, review of inventory reports, fire equipment and manpower resource rosters, etc.

g. Hazard maps are a part of the resource area fire prevention plan. Problems are encountered in maintaining the currency of hazard maps because of the time requirement to modify or redraw the map, reproduce it and distribute the copies.

h. The manual procedures involved in retrieving the overview of total protection resources available to suppress a fire are too time consumming. Necessary information must be gathered quickly and this is difficult because the information is now located in file cabinets, in folders, at some other office, etc.

i. The problem associated with rehabilitation is the difficulty in assembling historical data pertaining to the damaged area such as soil types, vegetation, trees, watershed, and other characteristics. This information must be compiled from various sources such as URA type map overlays, records of field inventories made several years prior, etc. Rehabilitation stores inventories of other offices and private supplies are difficult to access when an immediate need arises for such items as seed, heavy equipment, etc.

j. The majority of districts do not obtain Material Fire Danger Rating information and must rely on weather reports to determine potential fire hazard areas or to analyze effects on an on-going fire.

6.13.1.3.3 Supporting Charts

Chart 1 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.13.1.3.1 to the problems identified in Section 6.13.1.3.2. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which problem areas

b. To show how widespread a problem is by presenting the number of application area tasks affected by that problem

c. Assuming that the more widespread a problem the higher priority for solution, it can be used as the basis for determining a schedule for implementing solutions.

PROBLEMS / TASKS	a. Cost/Effectiveness time and manpower	b. Alternative evaluation workload	c. Alternative evaluation methodology	d. Program revision methodology	e. Protection resource collection workload	f. Protection resources collection methodology	g. Hazard map currency	h. Dispersed protection resource info.	i. Historical damage area data assemblage	j. Material fire danger rating info.		
a. Preliminary	X	X	X	X	X					X		
b. Prevention					X		X			X		
c. Presuppression					X	X	X	X		X		
d. Suppression					X	X	X	X		X		
e. Rehabilitation					X				X	X		

Chart 1. Problems vs Tasks

Chart 2 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.13.1.3.1 to the current BLM ADP support systems. The matrix is intended to show which application area tasks are currently supported in any degree by automation.

TASKS / CURRENT ADP SUPPORT SYSTEMS	a. Preliminary analysis	b. Prevention	c. Presuppression	d. Suppression	e. Rehabilitation							
• National Fire Danger Rating System – AFFIRMS		X	X	X	X							
• BIFC Warehouse Control			X									
• Fire Statistics				X								

Chart 2. Problems vs Current ADP Support

6.13.1.4 Required ADP Capabilities

6.13.1.4.1 Description

Personnel, stores and equipment data are key information bases for the majority of the protection tasks since this information comprises the bulk of protection resources inventory. The development of Manpower and Organization and Property Control and Management application packages which could provide this information would be beneficial, however there is no absolute requirement for their development since this information could be put into this application package manually. The initial attack configuration cost model, which would benefit BLM in determining protection budgets, is recommended for development as is. The configuration effectiveness model which would give fire control planners a tool to determine alternatives in configurations.

Structured data handling would enable fire and pest control personnel to more efficiently utilize personnel, stores and equipment by having a complete and current resources inventory available to them. The mapping graphics ADP capability would provide map manipulation capability. Special processing required to interface BLM's computer system with the National Fire Danger Rating system, would benefit all district offices, and the image processing provides analysis of large damaged areas, assessing damage values by differencing pre and post images of the area, detect pest infestation areas, etc.

Full automation of this application area will require the capabilities described below:

a. Structured data handling:

   1. Update -- required to enter cost, effectiveness, personnel and property utilization data

   2. Pre-defined retrieval/output -- necessary for cost and effectiveness model reports, and resource and utilization summaries

   3. Ad hoc retrieval/output -- required to display resources information via user composed queries.

b. Mapping-graphics retrieval/output -- necessary to display natural resource overlays and hazard maps

c. Special processing -- necessary to perform initial attack cost/effectiveness modeling and development of hazard sign and posting plan. Required to tie into the National Fire Danger Rating system.

d. Image processing -- an alternate (to manual) photo interpretation to determine damaged areas and to perform differencing of images in monitoring rehabilitation progress. Historical images could be processed to evaluate what was damaged and determine values of loss.

e. Data base conversion would be used to convert data needed to perform cost and effectiveness modeling as well as standard protection into the new data base.

6.13.1.4.2 Supporting Charts

Chart 3 is a matrix which presents the relationship of the application area tasks and subtasks described in detail in Section 6.13.1.3.1 to the required ADP capabilities identified, specifically, in Section 6.13.1.4.1 and, generally Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required to support the application area tasks and subtasks

b. To show which ADP capabilities provide the most support throughout the application area

c. Assuming the more tasks associated with an ADP capability associated with the greater the need for its development, it can be used as a basis for determining a schedule for development.

Chart 3. ADP Capabilities vs Tasks

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Preliminary analysis																					
1. Determine costs:																					
(a) load model data	X																X		X		Cost modeling
(b) process input control statements									X											X	
(c) extract resources/cost		X																	X		
(d) process input data									X										X		
(e) generate cost config. output									X										X		
2. Evaluate effectiveness:																					
(a) load model data	X																X		X		
(b) process input control statements									X											X	Effectiveness modeling
(c) extract model data		X																	X		
(d) process									X										X		
(e) generate efft. config. output									X										X		
3. Weight control against value threatened									X										X		
4. Courses of action									X										X		
5. Coordination with other agencies																					
6. Review with public																					
b. Prevention																					
1. Protection resources inv.:																					
(a) retrieve:																					
(1) personnel records			X																X		Note: data stored by corresponding application pkgs.
(2) stores/equip records			X																		
(3) real property records			X																		
(b) summaries	X																			X	
(c) natural resource overlays					X																
2. Hazard assessment/control:																					
(a) retrieve resources overlay					X																
(b) retrieve resources data			X																X		
(c) N.F.D.R. system tie-in									X												
(d) develop hazard map					X														X		Dial-up capability requires RI interpretation to create map
(e) develop sign and posting plan									X												Appl. program

Chart 3. ADP Capabilities vs Tasks (Continued)

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
		Retrieval/ Output																			
	Update	Pre-defined	Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
c. Presuppression:																					
1. Determine commitment:																					
(a) retrieve:																					
(1) personnel records			X																X		
(2) stores/equip records			X																X		
(3) real property records			X																X		
(4) summaries		X																	X		
d. Suppression																					
1. Assess damage/effectiveness																					
(a) outline damaged area				X																	
(b) interpret aerial photo										*	*	*	*	*					X		*alternate capability to manual interpretation
(c) retrieve land resources			X																X		
(d) display resource overlay					X																
(e) enter utilization info:																					
(1) personnel	X																		X		
(2) property	X																		X		
(f) summarize utilization		X																		X	
e. Rehabilitation:																					
1. determine rehabilitation needs:																					
(a) retrieve store/equip			X																X		

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Chart 4 is a matrix which presents the relationship of the required ADP capabilities described in detail in Section 6.13.1.4.2 and generally in Appendix A to the problems identified in Section 6.13.1.3.2. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are needed to help solve the problems in the application area

b. To show which ADP capabilities provide the most support, i.e., help solve the most problems

c. Assuming the more problems solved by an ADP capability the greater the need, it can be used as the basis for determining a schedule for development.

Chart 4. ADP Capabilities vs Problems

PROBLEMS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Cost/effectiveness time and manpower									X											X	cost/effect modeling
b. Alternative evaluation workload									X											X	cost modeling
c. Alternative evaluation methodology									X											X	effectiveness model
d. Program revision methodology									X											X	cost/effect model
e. Protection resources collection workload	X																		X		
f. Protection resources collection methodology			X																X		
g. Hazard map currency					X														X	X	
h. Dispersed protection resources information			X																		
i. Historical damage area data assemblage			X		X														X		
j. Material fire danger rating information.									X												

6.13.2 Benefits

6.13.2.1 Introduction

The benefits of applying specified ADP capabilities to current BLM situations problems can be measured in terms of:

a. Fire control initial attack configuration costs and effectiveness more accurately estimated for budgeting.

b. Increase in usefullness of protection resources information.

c. Increased responsiveness in transferring information betweem BLM offices.

d. Opportunity to tie into the National Fire Danger Rating System.

e. Protection cost savings by increases in optimizing suppression commitment levels.

f. Using combinations of ADP capabilities, the fire control specialists will be able to selectively retrieve data.

6.13.2.2 Detail Benefits

a. Reduction of time required to perform the preliminary analysis necessary to develop the Normal Fire Year plan. Presently it requires several years to prepare the initial plan and an estimated one year to generate a new plan. The automated initial attack configuration cost and effectiveness modeling will speed up this process.

b. Reduce the workload of protection planners by reducing time required to develop the NFYP. This will free them to evaluate, thoroughly, methods for economically providing BLM's desired level of protection. Currently this heavy workload has prevented this thorough evaluation.

c. Provide an objective method, which presently does not exist, for evaluating the effectiveness of alternate

approaches to fire and pest protection and to evaluate the effectiveness of the existing forces in meeting BLM objectives. This objectivity is gained by employing the modeling techniques used in this package.

d. Opportunity to directly access the National Fire Danger Rating system, which is presently not available to all BLM districts. The hardware (terminal) necessary to implement this application could be "dialed into" the NFDR.

e. Ease of monitoring and evaluating the total protection resources available and expended in suppression activities, by drawing on information from the implemented packages of; Manpower and Organization, Accounting and Fund Control, and Resource Inventory Management Applications. Presently this information is gathered on a piece-meal basis.

f. Reduce the time spent in collecting selective protection resources. The automated system would provide for retrieval and display of selective data by the requestor specifying the format or an ad hoc request for the data.

g. More immediate response in gathering or compiling all resources expended on a particular fire or pest control activity. The system will accummulate information about personnel, stores, equipment and other related information assigned a particular activity.

h. More efficient use of manpower would be gained by the automated system assisting in outlining hazard areas, burn scars etc. The computation of damage area acreage, summarizing dispatch to crew arrival times, retrieval of natural resource overlays, etc. would also be more efficient

i. Added capability to retrieve and review stores, equipment, weather data and other resources information from other BLM and agency offices. The automated system would be an integrated network which would allow inter-office data transfer.

j. Ease of adding to or modifying hazard maps. Once modified, any subsequent display will show the current status.

6.13.2.3 Supporting Charts

Chart 5 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.13.1.3.1 to the anticipated benefits identified in Section 6.13.2 and the output products. The matrix is intended to serve four purposes:

a. To provide a list of the generic products associatedwith a task.

b. To show the anticipated benefits associated with a particular task.

c. Assuming that the more anticipated benefits associated with a task the greater the gain to BLM, it can be used as the basis for determining a schedule for implementation

d. To show how widespread a benefit is by presenting the number of application area tasks affected by the benefit.

TASKS	PRODUCTS	BENEFITS											
		a. Reduce NFYP preparation time	b. Thorough evaluation of BLM protection level	c. Alternative approach effective measure	d. Direct access to NFDR	e. Monitor & evaluate protection resources	f. Save time selecting protection resources	g. Faster response about protection resources expended	h. Outlining hazard maps automatically	i. Interoffice communication	j. Easy hazard map modification	
a. Preliminary Analysis	Fire Control Configuration Cost Model Reports											
	• Total cost of all end item support requirements within the configuration											
	• Cost differences between planning configuration and configuration used as the base for changes											
	• Cost of each end item added											
	• Identification of all support requirements associated with each end item changed	X	X	X								
	• Listing of all inputs with a clear indication of format and syntax errors											
	• Variety of detailed and summary listings of configuration personnel, equipment and supplies, identification and costs											
	Fire Control Initial Attack Configuration Effectiveness Model Reports											
b. Prevention	• Protection Resources Inventory reports											
	• Fire hazard map				X	X	X	X	X	X	X	
	• Protection Sign and Posting plan											
c. Pre-suppression	• Protection Resources Inventory				X	X	X	X	X	X	X	
	• Fire hazard map											

Chart 5. Tasks vs Products and Benefits

TASKS	PRODUCTS	BENEFITS										
		a. Reduce NFYP preparation time	b. Thorough evaluation of BLM protection level	c. Alternative approach effective measure	d. Direct access to NFDR	e. Monitor & evaluate protection resources	f. Save time selecting protection resources	g. Faster response about protection resources expended	h. Outlining hazard maps automatically	i. Interoffice communication	j. Easy hazard map modification	
d. Suppression	• Protection Resources Inventory reports											
	• Post-fire Evaluation reports				X	X	X	X		X		
e. Rehabilitation	• Protection Resources Inventory reports											
	• Fire and Pest Rehabilitation maps				X	X	X	X	X	X	X	
	• Rehabilitation detailed and summary status report											

Chart 5. Tasks vs Products and Benefits (Continued)

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Chart 6 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.13.1.3.1 to the potential BLM users of products generated when the task is automated. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which users

b. To show how many users will receive products from automation of the particular task

c. Assuming that the more anticipated users, the higher the priority for implementation, it can be used as a basis for determining an implementation schedule.

TASKS \ USERS	State Office Manager	State Office Staff	District Office PRO Manager	District Office PRO Staff	BIFC Manager	BIFC Staff						
a. Preliminary Analysis			X		X							
b. Prevention		X		X		X						
c. Presuppression	X		X		X							
d. Suppression		X		X		X						
e. Rehabilitation		X		X		X						

Chart 6. Tasks vs User

Chart 7 is a matrix which presents the relationship of the anticipated benefits described in detail in Section 6.13.2 to the required ADP capabilities identified specifically in Section 6.13.1.4.1 and generally in Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required by this application area to realize the anticipated benefits

b. To show which ADP capabilities provide the most support in terms of the number of benefits associated with a particular ADP capability

c. Assuming the more anticipated benefits associated with an ADP capability the greater the need for the capability, it can be used as the basis for determining a development schedule.

Chart 7. Benefits vs ADP Capabilities

BENEFITS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Reduce NFYP preparation time									X										X		
b. Thorough evaluation of BLM protection level		X																	X		
c. Alternative approach effectiveness measure									X										X		
d. Direct access to NFDR		X																	X		
e. Monitor and evaluate protection resources		X	X																X		
f. Save time selecting protection resources			X																X		
g. Faster response about protection resources expended		X	X																X		
h. Outlining hazard maps automatically					X				X										X		
i. Interoffice communication		X																	X		network is, system capability
j. Easy hazard map modification				X															X		

6.13.3 Requirements

6.13.3.1 Introduction

To realize the benefits in the previous section, the Protection Application package will require the support described in the following charts.

6.13.3.2 Supporting Charts

Chart 8 is a matrix which presents the data sets described in detail in Table 5-1 and in general in Appendix B that will be used by the application area tasks described in detail in Section 6.13.1.3.1. The matrix is intended to serve four purposes:

a. To show which data sets are required to execute application area tasks

b. To show how much use is made of a data set by representing the number of tasks within an application area that use the data set.

c. To show how the particular task uses the data in the data set, i.e., just displays the data, (R) adds new data (W) or corrects existing data. (R/W)

The symbols used at the intersections have the following meanings:

R - Indicates that the data in the data set is read, i.e., displayed on a video screen, in a report, etc., but no updating of the data takes place. This is just a visual display of the data for review, auditing, information, etc. For example, the resource specialist would want to examine previous resource surveys in a paticular area before making a field trip. To do this the various resource data sets are interrogated to determine if a resource survey was performed in the desired area and if so, what information was gathered in each resource category. This could be done initially using a video device and if the information is useful a hard copy could be obtained.

W - Indicates that the data set or a logical record is initially created without immediate review. An audit trail or error listing may be produced as a result of this update but no use is made of the updated data set. For example, a large amount of information may be added to a data set which would involve a time consuming effort to enter, edit and correct each transaction.

R/W - Indicates the data set is:

1. Created or updated and then used to produce a product. That is, the resource specialist enters the field collected data into the data set, makes corrections, if necessary, and the new data is displayed in a report.

2. Read and after some analysis data in the set is updated. For example, the resource specialist, prior to a field trip, could be perusing resource information from a resource area and, because of that specialist's knowledge of the area, fill in missing information.

R/* - Indicates that while reading the data in a data set a conflict with information in a second data set is discovered. No corrective action is taken at this time. For example, if the resource specialist was examining URAs in the secialists discipline and a discrepancy was noted with the previously examined resource inventory data, a field trip would be required before the discrepancy could be corrected.

It should be noted that the symbol used represents the most common usage of a data set by a task. This does not mean however that another function cannot be performed. The common procedure may be to read (R) only, but on occasion a write (W) or conflict reduction (R/*) may be done.

Detailed menus for each data set are found in Phase IV of the report.

Chart 8. Tasks vs Data Sets

TASKS	DATA SETS																				
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	MAP/MAP	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
a. Preliminary analysis	R			R			R						R	R	R	R	R			R		
b. Prevention	R			R			R							R/W	R		R					
c. Presuppression	R	R	R	R	R	R	R	R	R			R		R/W	R		R					
d. Suppression													R	R/W	R	R	R					
e. Rehabilitation	R	R			R	R	R	R						R/W								

Chart 9 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.13.1.3.1 to data maintained in other application areas and BLM personnel responsible for supplying application input data. The matrix is intended to serve three purposes:

a. To show which other application areas furnish information to the application area task

b. To show the personnel position titles within BLM which are responsible for providing information to the application area task

c. It may indicate critical application area linkages, which would affect the implementation sequence.

Chart 9. Tasks vs Application Area Inputs and Supplier Responsibility

TASKS	APPLICATION AREA INPUTS															SUPPLIERS							
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	EAR/EIS	Regional Analysis	Protection	State Staff	District Staff	BIFC Staff					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15								
a. Preliminary Analysis											X	X				X	X	X					
b. Prevention		X									X	X				X	X	X					
c. Presuppression											X	X											
d. Suppression		X				X					X	X				X	X	X					
e. Rehabilitation		X										X					X						

6.13.4 Application Package Relationships

6.13.4.1 Introduction

While a package is designed to be implemented without automated dependence on other packages, a relationship will still exist. This section will provide the reader with a pictorial portrayal of this relationship.

6.13.4.2 Relationship Chart

Chart 10 is a graphic presentation of package interrelationships. The connecting lines and arrows show the flow of the information and the number associated with the line refers to an explanatory paragraph in Section 6.16.

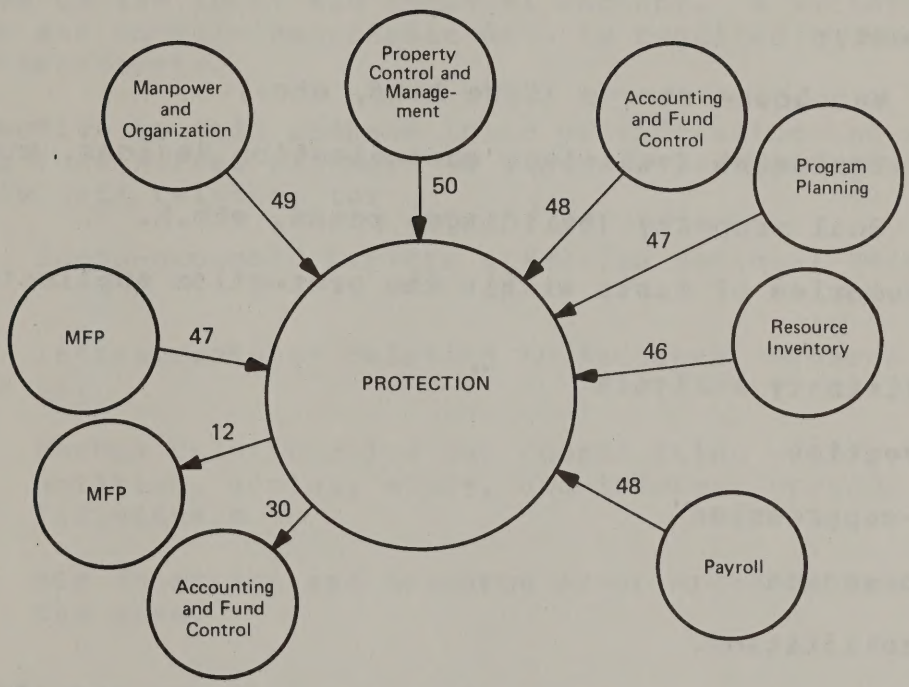

Chart 10. Package Interrelationships

6.13.5 Implementation Options

The categories of information comprising protection resources inventory are:

a. Fire/pest control personnel:

   1. Permanent

   2. Temporary.

b. Property:

   1. Warehouse stores (fire kits, etc.)

   2. Equipment (vehicles, communication devices, etc.)

   3. Real property (buildings, roads, etc.).

The major categories of tasks within the protection application are:

a. Preliminary analysis

b. Prevention

c. Pre-suppression

d. Suppression

e. Rehabilitation.

The implementation options open to Bureau management are the combinations of tasks and information categories which would best meet their goals.

6.14 PFGIONAL ANALYSIS

6.14.1 Introduction

6.14.1.1 Objective

PLM, in its role as manager of vast holdings of Federal natural resource wealth, must assess the impact of various resource decisions on the local and regional economy. A variety of economic and social-demographic data is required to support these impact assessments.

The objective to this package is to provide automated support for insuring that Bureau planners on State or District staffs have available data relating to:

a. Socio-economic factors affecting National Resource Lands.

b. Intrastructures relating to National Resource Lands (1606.05 I).

c. Bureau relationships and coordination with governmental entities, action, study, and interest groups, and key individuals.

d. BLM (District and Resource Area) organization history in the area.

6.14.1.2 Tasks

The tasks which will benefit from the implementation of this package are:

a. Gathering, organizing and recording of socio-economic-demographic (SFD) data

b. Analysis of SED data

c. Preparation and maintenance of supporting documents:

1. Social-Economic Profile (SEP)

2. Planning Area Analysis (PAA).

6.14.1.3 Current Situation

6.14.1.3.1 Description

a. Gathering of SED data:

1. Indentify source of information (e.g., government agencies, universities, libraries and other resource sources)

2. Obtain data from sources and place in library

3. Collect additional data (limited orginal data collection should be undertaken) and add to library

4. Identify areas on maps

5. Review and compile into form useful to BLM.

b. Analysis of SED data:

1. Review and analyze industrial relations (i.e., income, earnings, dependence, market, growth, etc.)

2. Review and analyze community relations (i.e., population, infrastructure, dependence, etc.)

3. Determine estimated value of retrieval resources

4. Identify trends in income, employment, public attitudes, etc.

5. Project resource production, income, employment and population.

c. Preparation and maintenance of supporting SED documents:

1. Depict interrelationships, trends, etc.

2. Write Narrative descriptions

3. Include map of area.

6.14.1.3.2 Problem Areas

Automation will help the BLM specialists (Economists, regional, planners, sociologists, other social scientists and professional staffs) in the following problem areas:

a. Locating and tracking down the source of economic, social and demographic data is a time consuming and a sometimes impossible job. Then after the information is located, evaluating it and keeping it current is required.

b. Combining the various pieces of data to make a meaningful composite picture of the economic, social and demographic character of an area is difficult. Boundaries of the data collected (ie., county) are not always useable for BLM purpose requiring extrapolations or boundary adjustments.

c. Projecting resource production, consumption and needs is a tedious task packed with danger areas. Establishing the relationship of BLM resources to the area's economic, social and demographic needs is difficult for current situations and becomes guess work in forecasting.

d. Displaying all of the information in a social-ecomonic profile (SEP) or Planning Area Analysis (PAA) requires the production of many tables and narrative descriptions. This is a very tedious and time consuming job.

6.14.1.3.3 Supporting Charts

Chart 1 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.14.1.2 to the problems identified in Section 6.14.1.3.2. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which problem areas

b. To show how widespread a problem is by presenting the number of application area tasks affected by that problem

c. Assuming that the more widespread a problem the higher priority for solution, it can be used as the basis for determining a schedule for implementing solutions.

PROBLEMS / TASKS	a. Gathering of SED	b. Analysis of SED	c. Preparation and maintenance of supporting documents									
a. Locating SED data	X	X	X									
b. Combining SED into composite		X										
c. Projecting		X										
d. Table and narrative production	X		X									

Chart 1. Problems vs Tasks

Chart 2 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.14.1.2 to the current BLM ADP support systems. The matrix is intended to show which application area tasks are currently supported in any degree by automation.

TASKS / CURRENT ADP SUPPORT SYSTEMS	a. Gather of SED	b. Analysis of SED	c. Preparation and maintenance of supporting documents									
Socio-economic Profiles		X	X									

Chart 2. Problems vs Current ADP Support

6.14.1.4 Required ADP Capabilities

!6.14.1.4.1 Description

PLM's activity in the community and surrounding areas can play major role in that communities development and growth. This is a very grave responsibility and so BLM must make every effort to ensure that its actions are in harmony with the community. Obtaining the social, economic and demographic data, properly analyzing it and using it in planning is, therefore, a vital function with BLM. To support the Regional Analysis area, which is mainly an analysis of the data, requires extensive use of the Special Processes capability linked directly with the update, retrieval and output of the Structured Data capability. These provide the Regional Analysis area with a meaningful ADP capability. The Special Processes capability can not function without source data so the Structured Data update capability should be developed first, followed closely by the Special Processes and the Structured Data retrieval/output capability.

Full automation of this application will require use of certain ADP capabilities. Those capabilities are described below:

a. Structured data handling update and predefined retreival/output capabilities will be used in all Region Analysis tasks.

b. Special processing will be used to calculate resource values and to project various trends, uses, needs etc.

c. Mapping/Graphics data entry/modification and retrieval/output will be used to identify areas on maps and to include them as part of the output document.

6.14.1.4.2 Supporting Charts

Chart 3 is a matrix which presents the relationship of the application area tasks and subtasks described in detail in Section 6.14.1.3.1 to the required ADP capabilities identified,

specifically, in Section 6.14.1.4.1 and, generally Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required to support the application area tasks and subtasks

b. To show which ADP capabilities provide the most support throughout the application area

c. Assuming the more tasks associated with an ADP capability associated with the greater the need for its development, it can be used as a basis for determining a schedule for development.

Chart 3. ADP Capabilities vs Tasks

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Gathering of SED data																					
1. Identify source of information		X																		X	
2. Obtain data from sources																					
3. Collect additional data	X																		X		
4. Identify areas on maps				X															X		
5. Review and compile into BLM usable form	X																		X		
b. Analysis of SED data																					
1. Review and analyze industrial relations									X										X		
2. Review and analyze community relations									X										X		
3. Determine est. value of resources									X										X		
4. Identify trends									X										X		
5. Project:																					
(a) resource production									X										X		
(b) income									X										X		
(c) employment									X										X		
(d) population									X										X		
c. Prepare and maintain supporting documents																					
1. Depict interrelationships, trends, etc.									X										X		
2. Narrative descriptions		X																	X		
3. Include map of area					X														X		

Chart 4 is a matrix which presents the relationship of the required ADP capabilities described in detail in Section 6.14.1.4.1 and generally in Appendix A to the problems identified in Section 6.14.1.3.2. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are needed to help solve the problems in the application area

b. To show which ADP capabilities provide the most support, i.e., help solve the most problems

c. Assuming the more problems solved by an ADP capability the greater the need, it can be used as the basis for determining a schedule for development.

Chart 4. ADP Capabilities vs Problems

ADP CAPABILITIES / PROBLEMS	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Locating SED data	X																		X		
b. Combining SED into composite									X										X		
c. Projecting									X										X		
d. Produce:																					
1. Tables		X																	X		
2. Narrative								X											X		
3. Maps					X																

6.14.2 Benefits

6.14.2.1 Introduction

The benefits of applying specified ADP capabilities to problems in the current BLM situation can be measured in terms of:

a. Better use of SED

b. More accurate projections

c. More useable reports.

6.14.2.2 Detailed Benefits

a. Providing automated, easily accessible support for social, economic and demographic (SED) analysis will provide Bureau management with a method for maintaining and making available semi-current supply and demand data needed to make sound multiple-use decisions:

   1. Economic evaluation of land uses - current or potential.

   2. Uniformity of appraisals with non-Bureau rates.

   3. Support for identifying the location/presence of publics interested in particular Bureau activities.

   4. Determining fair market value for leases and sales.

b. It will be possible for the user to combine SED data on an area -, region - or nation-wide level for more complete analysis of planning alternatives. (At present, SED data is not legally available below the county level of aggregation. A suggestion is that socio-economic data at lower levels could be obtained during field studies.)

c. Bureau planners will have a statistical tool to calculate the effect of production level of any resource on the economics, sociology and/or demography of the community inpact area.

d. Bureau planners will have the data and tools to perform long term trend analysis as it is related to BLM's mission, ie., commodity production and consumption as it affects BLM planning and needed program emphasis.

e. Access (3-4 day turnaround was condiered acceptable) to social, economic and demographic imformaties by subject matter, for environmental studies support, will be available using ADP technology.

f. Readily accessible user instructions for using various statistical techniques - an important tool for this package - will significantly decrease the idle-time for a new user.

6.14.2.3 Supporting Charts

Chart 5 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.14.1.2 to the anticipated benefits identified in Section 6.14.2.2 and the output products. The matrix is intended to serve four purposes:

a. To provide a list of the generic products associatedwith a task.

b. To show the anticipated benefits associated with a particular task.

c. Assuming that the more anticipated benefits associated with a task the greater the gain to BLM, it can be used as the basis for determining a schedule for implementation

d. To show how widespread a benefit is by presenting the number of application area tasks affected by the benefit.

TASKS	PRODUCTS	BENEFITS										
		a. Easily accessible data	b. Composite capability	c. Statistical tools	d. Trend analysis	e. Access by subject	f. Instructional aid					
a. Gather SED												
b. Analyze SED	• Benchmark projections • Dependence/relationship report	X	X	X	X	X	X					
c. Preparation and maintenance of supporting documents	• Social Economic Profiles (SEP) • Planning Area Analysis (PAA)	X				X						

Chart 5. Tasks vs Products and Benefits

Chart 6 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.14.1.2 to the potential BLM users of products generated when the task is automated. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which users

b. To show how many users will receive products from automation of the particular task

c. Assuming that the more anticipated users, the higher the priority for implementation, it can be used as a basis for determining an implementation schedule.

USERS / TASKS	State Staff	State Management	District Staff	District Management	Special Office Staff	Special Office Management						
a.	X	X	X	X	X	X						
b. Analyze SED	X		X		X							
c. Preparation & maintenance of supporting documents	X	X	X	X	X	X						

Chart 6. Tasks vs User

Chart 7 is a matrix which presents the relationship of the anticipated benefits described in detail in Section 6.14.2.2 to the required ADP capabilities identified specifically in Section 6.14.1.4.1 and generally in Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required by this application area to realize the anticipated benefits

b. To show which ADP capabilities provide the most support in terms of the number of benefits associated with a particular ADP capability

c. Assuming the more anticipated benefits associated with an ADP capability the greater the need for the capability, it can be used as the basis for determining a development schedule.

Chart 7. Benefits vs ADP Capabilities

BENEFITS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Easily accessible data		X																	X		
b. Composite capability									X										X		
c. Statistical tools									X										X		
d. Trend analysis									X										X		
e. Access by subject		X																	X		
f. Instructional aid															X				X		

6.14.3 Requirements

6.14.3.1 Introduction

To realize the benefits outlined in the previous section, the application package will need the support descried in the following charts.

6.14.3.2 Supporting Charts

Chart 8 is a matrix which presents the data sets described in detail in Table 5-1 and in general in Appendix B that will be used by the application area tasks described in detail in Section 6.14.1.2. The matrix is intended to serve three purposes:

a. To show which data sets are required to execute application area tasks

b. To show how much use is made of a data set by representing the number of tasks within an application area that use the data set.

c. To show how the particular task uses the data in the data set, i.e., just displays the data, (R) adds new data (W) or corrects existing data. (R/W)

The symbols used at the intersections have the following meanings:

R - Indicates that the data in the data set is read, i.e., displayed on a video screen, in a report, etc., but no updating of the data takes place. This is just a visual display of the data for review, auditing, information, etc. For example, the resource specialist would want to examine previous resource surveys in a paticular area before making a field trip. To do this the various resource data sets are interrogated to determine if a resource survey was performed in the desired area and if so, what information was gathered in each

resource category. This could be done initially using a video device and if the information is useful a hard copy could be obtained.

W - Indicates that the data set or a logical record is initially created without immediate review. An audit trail or error listing may be produced as a result of this update but no use is made of the updated data set. For example, a large amount of information may be added to a data set which would involve a time consuming effort to enter, edit and correct each transaction.

R/W - Indicates the data set is:

1. Created or updated and then used to produce a product. That is, the resource specialist enters the field collected data into the data set, makes corrections, if necessary, and the new data is displayed in a report.

2. Read and after some analysis data in the set is updated. For example, the resource specialist, prior to a field trip, could be perusing resource information from a resource area and, because of that specialist's knowledge of the area, fill in missing information.

R/* - Indicates that while reading the data in a data set a conflict with information in a second data set is discovered. No corrective action is taken at this time. For example, if the resource specialist was examining URAs in the secialists discipline and a discrepancy was noted with the previously examined resource inventory data, a field trip would be required before the discrepancy could be corrected.

It should be noted that the symbol used represents the most common usage of a data set by a task. This does not mean however that another function cannot be performed. The common procedure may be to read (R) only, but on occasion a write (W) or conflict reduction (R/*) may be done.

Detailed menus for each data set are found in Phase IV of the report.

Chart 8. Tasks vs Data Sets

TASKS	DATA SETS																				
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	MAP/MAP	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
a. Gather SED												W										
b. Analyze SED												R/W										
c. Produce reports												R/W										

Chart 9 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.14.1.2 to data maintained in other application areas and BLM personnel responsible for supplying application input data. The matrix is intended to serve three purposes:

a. To show which other application areas furnish information to the application area task

b. To show the personnel position titles within BLM which are responsible for providing information to the application area task

c. It may indicate critical application area linkages, which would affect the implementation sequence.

Chart 9. Tasks vs Application Area Inputs and Supplier Responsibility

TASKS	APPLICATION AREA INPUTS															SUPPLIERS							
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	EAR/EIS	Regional Analysis	Protection	State Management	State Staff	District Staff	DSC Staff				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15								
a. Gather SED																X			X				
b. Analyze SED																	X	X	X				
c. Produce reports																	X	X					

6.14.4 Application Package Relationships

6.14.4.1 Introduction

While a package is designed to be implemented without automated dependence on other packages, a relationship will still exist. This section will provide a protrayal of this relationship.

6.14.4.2 Relationship Chart

Chart 10 is a graphic presentation of package interrelationships. The connecting lines show the flow of the informationa and the number associated with the line refers to an explanatory paragraph in Section 6.16.

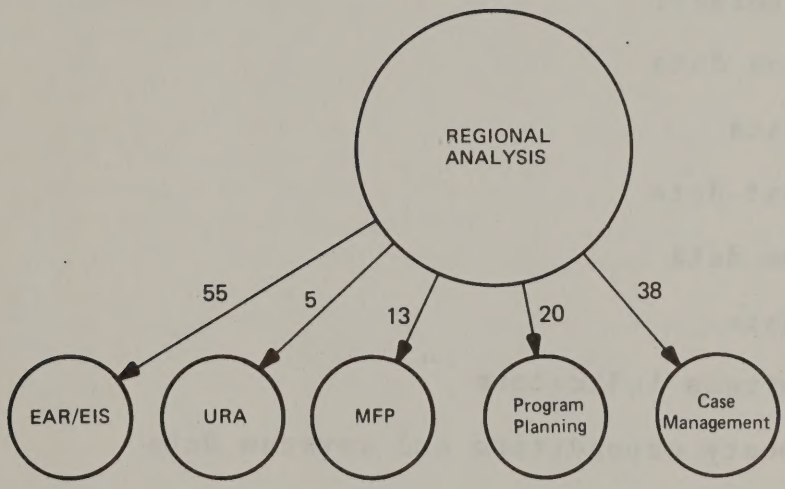

Chart 10. Package Interrelationships

6.14.5 Implementation Options

There are various categoris of social demographic and economic data. It is not necessary or recommended that all BLM zones of influence be included at once.

It is recommended to implement Regional Analysis on a phased basis as dictated by demand for BLM services, by Bureau Personnel and data resources and by Management's priority ranking of SED data needs.

Data categories include:

a. Population data

b. Income data

c. Employment data

d. Fducation data

e. Health data

f. Social stress indicators

g. State/county expenditure and revenue data

h. Housing data

i. Agriculture sales data

j. Livestock Feed analysis information

k. Timber slaes data

l. Mineral sales data

m. Economic activity indicators

n. Industrial Investments

o. Determine the publics to be invloved and their social and economic concerns

p. Present the program activities, and competing uses to the publics tailored to meet their interests

q. Identify the interests of geographically removed publics (out-of-state hunters).

6.15 ENVIRONMENTAL ANALYSIS REPORT/ENVIRONMENTAL IMPACT STATEMENT (EAR/EIS) PREPARATION AND PUBLICATION (EEPAP)

6.15.1 Introduction

6.15.1.1 Objective

In any proposal for construction or development, it is the usual practice, both from the standpoint of engineering and economics, to prepare an analysis of the need for the development and the relationship between the monetary costs and the anticipated benefits of the proposed action. More recently, it has been recognized that in addition to these customary economic analyses and discussions of need, there should be a detailed assessment of the effect of a proposed development on the environment independent of its monetary benefits and costs. Together these assessments provide an Environmental Impact Statement.

The National Environmental Policy Act of 1969 requires that all agencies of the Federal Government prepare detailed environmental impact statements on proposals for legislation and other major Federal actions significantly affecting the quality of human environment. The objectives of the Act is to build into the agency decision-making process an appropriate and careful consideration of all environmental aspects of proposed studies.

To meet the objectives of this Act, the Department of the Interior and the Bureau of Land Management have defined eight major components of the EIS. These are:

a. A description of the proposal which includes sufficient technical data to permit assessment of the environmental impact.

b. A description of the existing and anticipated future environment without the proposed action.

c. An evaluation of the potential environmental impact of the proposed action.

d. A discussion of measures which are proposed or required to enhance, protect, or mitigate the identified impacts.

e. A discussion of any adverse impacts which cannot be avoided should the proposed action be taken.

f. A discussion of the short-term use of the environment in relation to its long-term impacts on the productive capacity of the area both for the same use and other uses.

g. A discussion identifying any irrevocable uses of the existing resources which would occur should the proposed action be taken.

h. A discussion of potential alternatives to the proposed action with the possible environmental impacts of all reasonable alternatives.

6.15.1.2 Tasks

The EAP/EIS Preparation Application Tasks which will benefit from the implementation of this package are:

a. Identifying individuals or groups with prior experience in addressing these impacts.

b. Identifying potential impacts.

c. Identifying related resources and environmental studies, including previous EIS documents and constructing and maintaining a refererence library.

d. Identifying existing local and Federal regulations which may place legal limits on certain impacts.

e. Identifying other agencies, officials, and special interest groups to be contacted on various types of BLM actions.

f. Evaluating the impacts of the proposed actions using models and other mathematical tools.

g. Accessing the area descriptive data pertinent to the proposed actions.

h. Preparing, updating, and producing the required EIS/EAP documents.

i. Providing management with the information needed to better track and control the preparation of an estimated 7,000 to 10,000 EAR/EIS documents each year.

j. Cataloging and storing completed EIS/EAR statements.

6.15.1.3 Current Situation

6.15.1.3.1 Description

Currently, the EIS/EAR documents are developed by a team of resource analysts.

6.15.1.3.2 Problem Areas

The current situation in BLM for preparing the EIS/EAR statements involves the following problems:

a. Employees assigned to the EIS/EAR activity normally have not had extensive prior experience in preparing these documents. They often do not know the type of information to include, the level of detail required, or the sources for obtaining assistance. In addition, there is no guidance as to the characteristics which determine the adequacy of the resulting document.

b. The reference data required to adequately describe the environment of the area being considered is not readily accessable by the EIS/EAR team. The required data must be gathered from many scattered and varied sources. This can result in overlooking a source of needed relevant data, excessive time spent seeking out needed data, and excessive costs to BLM.

c. The members of the EIS/EAR team are not necessarily familiar with the existence of various models and other mathematical tools which sould be used in providing the required assessments. Even if the existence of the models is known, the need to manually perform the complex calculations can result in minimal application of these tools or errors in the results of the calculations.

d. EIS/EAR preparation has presented a continually growing workload which has been consistently underestimated in the budget estimates. This has resulted in an added workload on the existing BLM resources, thereby creating a dilution of the effort directed towards achieving the normal BLM objectives.

e. Distribution of the EIS/EAR documents within the government is well identified; however, there is no source which identifies the public individuals and groups who have requested copies of the EIS/EAR or who should normally receive copies of all EIS/EAR reports relevant to a certain area or topic.

f. The workload to prepare, edit, modify, and produce the EIS/EAR reports requires a significant use of BLM technical personnel.

g. Currently ADP support for preparation of EIS/EAR documents is not available in any formalized way within BLM.

6.15.1.3.3 Supporting Charts

Chart 1 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.15.1.2 to the problems identified in Section 6.15.1.3.2. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which problem areas

b. To show how widespread a problem is by presenting the number of application area tasks affected by that problem

c. Assuming that the more widespread a problem the higher priority for solution, it can be used as the basis for determining a schedule for implementing solutions.

PROBLEMS / TASKS	a. Inexperienced personnel – no guidance	b. Reference data scattered	c. Unfamiliiliarity whth models – calculation subject to error	*d. Dilution of BLM effect number	e. Public distribution unknown	f. Large document preparation workload	g. No current ADP support					
a. Identify information sources	X	X					X					
Select EIS/EAR preparation team							X					
b. Identify potential impacts	X						X					
c. Identify related studies	X	X					X					
Collect needed information	X	X					X					
Prepare area description	X	X										
d. Identify existing regulations		X		X	X		X					
e. Identify agencies to contact		X		X	X		X					
f. Evaluate potential impacts	X		X				X					
Identify design mitigations												
Reevaluate potential impacts	X		X				X					
Identify design/operational changes	X											
g. Short/long term impacts are identical	X		X				X					
and evaluated	X		X				X					
Irrevocable resource uses are identified and evaluated	X		X				X					
Alternative approaches are identified and evaluated	X		X				X					
h. Preparing, updating and producing the required EIS/EAR documents:												
1. Preliminary draft EIS/EAR is produced and distributed	X					X	X					
2. Preliminary draft EIS/EAR is modified and edited						X	X					
3. Draft EIS/EAR is produced and distributed					X	X	X					
4. Draft EIS/EAR modified and edited					X	X	X					
5. Final EIS/EAR produced and distributed					X	X	X					
6. Final EIS modified per public hearings produced and distributed					X	X	X					
i. Management					X	X	X					

*Impact is on other BLM work not directly on EIA/EAR preparation

Chart 1. Problems vs Tasks

Chart 2 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.15.1.2 to the current BLM ADP support systems. The matrix is intended to show which application area tasks are currently supported in any degree by automation.

TASKS / CURRENT ADP SUPPORT SYSTEMS	a. Identify information sources	b. Identify potential impacts	c. Identify related studies	d. Identify existing regulations	e. Identify agencies to contact	f. Evaluate	g. Assess area data	h. Document				
CRIS												
Map/Model												
Socio-Economic Profiles												

Chart 2. Problems vs Current ADP Support

6.15.1.4 ADP Capabilities

6.15.1.4.1 Description

Automation of this application area requires the use of certain ADP capabilities:

a. Structured data handling - This ADP capability can be used to provide listings of potential environmental impacts for a proposed BLM action with the identification of individuals and groups with prior experience in assessing these impacts. Also included in the output could be the address and telephone numbers of these sources of information and assistance. The personnel identified in this list can also be considered for possible inclusion on the EIS/EAR preparation team.

   Another use would be to maintain a mailing list of both government and private organizations and individuals to be contacted for input and who should also receive copies of the Draft and Final EIS/EAR documents.

   Finally the structural data handling capability could be used to provide management with the tools to better:

   1. Schedule the EAR/EIS workload so as not to adversely impact the performance of other BLM activities.

   2. Track the status of the EAR/EIS preparation from start to completion.

   3. Identify the schedule and manpower required for completion of each EAR/EIS.

b. Mapping/Graphics - This ADP capability can be used to provide maps and listings directly pertinent to the area of interest which provide complete and up-to-date information on the status of the resources, climatology, topography, and environment of the area. By inputting the topographic changes which will take place at various stages in the project, this system would permit the outputting of maps which show the resultant land

configuration at the various stages of the development of the project.

The graphic capability would also provide the capability to generate visual outputs such as cross-sectional views in addition to the normal planar views and graphic representations such as wind roses and frequency disributions.

c. Text processing - ADP capability can be used in three ways for EIS/EAR development:

1. Retrieval of pertinent textual information

2. Editing and preparation of the required reports.

3. Update to develop and maintain a reference library.

The text retrieval capability can be used to selectively determine which of a multitude of reference documents is pertinent to the EIS/EAR analysis under consideration. These referenced documents could include such material as: previously developed EIS/EAR reports, research investigations on environmental impacts, engineering studies on design and operation of similar activities and environmental studies performed by both government and non-government sources. The success of this capability in providing the necessary information to the various EIS/EAR teams is a direct function of the completeness of the implemented data base. However, it would be reasonable to expect that such a centralized capability would provide more complete information than could be gathered independently by each individual EIS/EAR team.

In addition to the above, the text retrieval capability could be used to selectively access a data base of local and Federal environmental regulations to select those applicable to the project under consideration.

The text editing and preparation capability could be used to ease the burden on the EIS/EAR preparation team in preparing the various preliminary draft, draft, and final documents. This type of system would be extremely useful in modifying previously generated documents to

incorporate changes in answer to comments received from review of the draft documents or at the required public hearings.

d. Special Processing - Analysis of environmental impacts often requires the application of physical models and other mathematical tools or aids. The Special Processing Capability indicated here would provide these tools in an easily useable form to the analysis team.

In FY1974 BLM preposal and submitted to the Council of Environmental Quality (CEQ) fourteen (14) draft and seven (7) final EIS. In addition BLM also developed seven (7) EAR and 9356 negative determinations. These actions plus requirements to review and assist with EIS on other activites required the application of 239 man years of BLM effort and a total expenditure of $3,975,000 of BLM funds during FY1974. Growth of this workload over the past several years has been extreme with an estimated year-to-year increase from 1972 to 1973 of over 200% and from 1973 to 1974 of approximately 25%.

Another problem exists in that the workload created by the EIS/EAR requirement has not been anticipated in the budget requests. For example of the $3,975,000 expended in FY1974 only $900,000 was budgeted for this purpose.

The need and desireability of preparing complete analysis of the impact on the environment of proposed BLM actions has become more obvious as the status of the environment has degraded. The National Environmental Policy Act has placed this need into a requirement. The impact of this requirement on BLM, as shown above, is significant. It seems prudent to evaluate the application of ADP capability to reduce this impact while maintaining and even improving the quality of the resulting documents. Areas where ADP capability may prove beneficial have been identified. The various ADP capabilities identified (Structured Data Handling, Mapping and Graphics, Text Processing and Special Processing) each meet a different need in the EIS/EAR development process and are not interrelated. Therefore, each component can be developed independently and each,individually, can provide a benefit to the EIS/EAR development process.

6.15.1.4.2 Supporting Charts

Chart 3 is a matrix which presents the relationship of the application area tasks and subtasks described in detail in Section 6.15.1.2 to the required ADP capabilities identified, specifically, in Section 6.15.1.4.1 and, generally Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required to support the application area tasks and subtasks

b. To show which ADP capabilities provide the most support throughout the application area

c. Assuming the more tasks associated with an ADP capability associated with the greater the need for its development, it can be used as a basis for determining a schedule for development.

Chart 3. ADP Capabilities vs Tasks

TASKS \ ADP CAPABILITIES	Structured Data Handling			Mapping/ Graphics		Text Processing				Image Processing					Computer Assisted Training				Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition	Special Processes	Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local	Data Base Conversion	Microfilm	Interactive Online	Batch	
a. Identify information sources		X																	X		
Select team		X																	X		
b. Identify potential impacts		X																	X		
c. Identify related studies							X												X		
Collect needed information					X		X												X		
Prepare area descriptions					X														X		
d. Identify existing regulations							X												X		
e. Identify agencies to contact		X																	X		
f. Evaluate potential impacts					X		X		X										X		
Identify design mitigations		X							X										X		
Reevaluate potential impacts					X				X										X		
Identify design/operational changes							X		X										X		
									X										X		
g. Short/long term impacts		X																	X		
Irrevocable resource uses					X														X		
Alternative approaches							X		X												
h. Document:																					
1. Preliminary draft prod.							X	X											X		
2. Preliminary draft modified						X													X		
3. Draft is produced								X											X		
4. Draft is modified						X													X		
5. Final EIS produced								X											X		
6. Final EIS modified						X													X		
i. Management		X	X																		

Chart 4 is a matrix which presents the relationship of the required ADP capabilities described in detail in Section 6.15.1.4.1 and generally in Appendix A to the problems identified in Section 6.15.1.3.2. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are needed to help solve the problems in the application area

b. To show which ADP capabilities provide the most support, i.e., help solve the most problems

c. Assuming the more problems solved by an ADP capability the greater the need, it can be used as the basis for determining a schedule for development.

Chart 4. ADP Capabilities vs Problems

ADP CAPABILITIES / PROBLEMS	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Lack of experience and guidance		X					X														
b. Inadequate accessiblity of descriptive data					X		X														
c. Knowledge usability of models and other mathematical tools									X												
d. Increasing workload impacts normal duties		X			X	X	X	X	X												
e. Distribution to public agencies and individuals							X														
f. Report, edit and preparation workload						X	X														
g. Limited current ADP capability not formalized.		X				X	X	X	X												

6.15.2 Benefits

6.15.2.1 Introduction

The ADP capabilities previously identified will result in the following general benefits:

a. Improved quality and uniformity of the EIS/EAR preparation products.

b. Lowered cost and personnel resources required to develop required EIS/EAR preparation products.

c. Shortened time from inception to delivery of EIS/EAR preparation product.

d. Improved managment control of the EAR/EIS preparation process.

6.15.2.2 Detailed Benefits

a. Identification of BLM personnel with applicable experience for forming the EIS/EAR preparation team or for consultation

b. Easy identification of and more complete information on:

   1. Potential impacts

   2. Sources of information

   3. Examples of prior work

   4. Secondary impacts.

c. Uniform and complete sets of the mathematical tools required for impact evaluation readily available and easily useable by all analysis teams resulting in

improved impact analysis, increased accuracy and reduced analysis time.

d. Easy reference to:

   1. Existing regulations relating to potential environmental impacts.

   2. Names, address and activites of other interested agencies and organizations.

   3. Previously completed EIS/EAR.

e. Ready access to the data needed to provide the existing environment and resource descriptions required for the EIS/EAR.

f. Ease of editing, updating and producing the EAR/EIS documents.

g. Overall greater uniformity in the approach to and the results of the preparation of the EAR and EIS documents.

h. Centralized development, maintenance and update of the various data sets should result in more complete and up-to-date information being made available uniformily to all the analysis teams.

i. By keeping a computer data base current at a central location and offering remote access to the data base, the proliferation of hardcopy manual reference libraries which are generally out-of-date becomes minimized. Futhermore, the need for a new task force to assemble a library before they begin work is eliminated.

j. Better control of the EAR/EIS preparation expenditures and schedules.

6.15.2.3 Supporting Charts

Chart 5 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.15.1.2 to

the anticipated benefits identified in Section 6.15.2.2 and the output products. The matrix is intended to serve four purposes:

a. To provide a list of the generic products associatedwith a task.

b. To show the anticipated benefits associated with a particular task.

c. Assuming that the more anticipated benefits associated with a task the greater the gain to BLM, it can be used as the basis for determining a schedule for implementation

d. To show how widespread a benefit is by presenting the number of application area tasks affected by the benefit.

TASKS	PRODUCTS	BENEFITS										
		a. Experienced personnel identification	b. Impact and information source identification	c. Readily available up-to-date mathematical tools	d. Easy reference to related regulations	e. Ready access to resource and environmental data	f. Reduced report production effort	g. Overall greater uniformity and quality	h. Equal access to up-to-date information	i. Reduced proliferation of hard copy references	j. Improved management control	
a. Identify information sources Select EIS/EAR preparation team	1. Listing of BLM personnel experienced in various aspects of proposed action.											
	2. Listing of other individuals as potential information sources referenced to specialty.	X	X					X	X			
b. Identify potential Impacts	1. Listing of potential environmental impacts											
	2. Listing of subactivities normally associated with proposed action		X					X	X			
c. Identify Related Studies	1. Key-word text retrieval of references to related studies and previous EIS/EAR documents (including resource studies).		X			X		X	X	X		
Collect needed information	1. Maps, listings and graphical presentations of resource to topographical, climatological and environmental data on the area(s) under consideration for the proposed action.				X	X		X	X			
	2. Key-word text retrieval of environmental regulations pertinent to the area(s) of interest.											

Chart 5. Tasks vs Products and Benefits

TASKS	PRODUCTS	BENEFITS										
		a. Experienced personnel identification	b. Impact and information source identification	c. Readily available up-to-date mathematical tools	d. Easy reference to related regulations	e. Ready access to resource and environmental data	f. Reduced report production effort	g. Overall greater uniformity and quality	h. Equal access to up-to-date information	i. Reduced proliferation of hardcopy references		
Prepare area description	1. Maps showing pertinent characteristics of the area(s) under study.					X		X	X			
	2. Graphics of pertinent data such as wind distribution, temperature range and precipitation history											
d. Identify existing regulations	1. Listing of abstracts of current local and Federal regulations	X	X		X							
e. Identify agencies to contact	1. Listing of agencies interested in BLM actions									X		
f. Evaluate potential impacts	1. Mathematical analysis of the potential impacts given no mitigating action. Outputs may be in tabular, graphical or map format			X		X		X	X			
Identify design mitigations												
Reevaluate potential impacts	1. Mathematical analyses of the potential impacts with designed mitigating action. Outputs may be in tabular, graphical or map format			X				X	X			
Identify design/ operational	1. Listing of similar projects with references to pertinent design/ operational documents											
	2. Mathematical analyses of potential design/operation changes. Outputs maybe in tabular, graphical or map format		X	X				X	X	X		

Chart 5. Tasks vs Products and Benefits (Continued)

TASKS	PRODUCTS	BENEFITS										
		a. Experienced personnel identification	b. Impact and information source identification	c. Readily available up-to-date mathematical tools	d. Easy reference to related regulations	e. Ready access to resource and environmental data	f. Reduced report production effort	g. Overall greater uniformity and quality	h. Equal access to up-to-date information	i. Reduced proliferation of hardcopy references		
h. Document:												
1. Preliminary Draft Produced and distributed	1. Preliminary draft of EIS/EAR document ready for distribution				X		X	X				
	2. Distribution list											
2. Preliminary Draft Modified	1. Updated and edited version of preliminary draft						X	X				
3. Draft EIS/EAR produced and distributed	1. Draft EIS/EAR document ready for distribution				X		X	X				
	2. Distribution list											
4. Draft EIS/EAR Modified	1. Updated and edited version of Draft EIS/EAR						X	X				
5. EIS/EAR is produced and distributed	1. EIS/EAR document ready for distribution				X		X	X				
	2. Distribution list											
6. Final EIS/EAR modified, produced and distributed	1. Updated edited version of EIS/EAR				X		X	X				
	2. Final EIS/EAR document ready for distribution											
	3. Distribution list											
i. Management	1. Formatted and ad hoc outputs presenting data on specific EAR/EIS and total EAR/EIS schedules and manpower requirements									X		

Chart 5. Tasks vs Products and Benefits (Continued)

TASKS	PRODUCTS	BENEFITS											
		a. Experienced personnel identification	b. Impact and information source identification	c. Readily available up-to-date mathematical tools	d. Easy reference to related regulations	e. Ready access to resource and environmental data	f. Reduced report production effort	g. Overall greater uniformity and quality	h. Equal access to up-to-date information	i. Reduced proliferation of hardcopy references	j. Improved management control	
g. Short/Long term Impacts	1. Listing of potential environmental impacts											
	2. Mathematical analyses to show the short/long term nature of the various impacts		X	X				X	X	X		
Irrevocable resource use	1. Maps and tabular presentation of area resource characteristics					X		X	X			
Alternative Approaches	1. Keyword retrieval of document references relating to similar projects and their engineering and operational characteristics.		X	X				X	X	X		
	2. Mathematical analyses to determine effects of alternative actions										X	

Chart 5. Tasks vs Products and Benefits (Continued)

Chart 7. Benefits vs ADP Capabilities

Chart 6 is a matrix which presents the relationship of the application area tasks described in detail in Section 6.15.1.2 to the potential BLM users of products generated when the task is automated. The matrix is intended to serve three purposes:

a. To show which application area tasks are associated with which users

b. To show how many users will receive products from automation of the particular task

c. Assuming that the more anticipated users, the higher the priority for implementation, it can be used as a basis for determining an implementation schedule.

USERS / TASKS	District Staff Planning Specialist	District Staff Resource Specialist	State Staff Planning	State Staff Resource	Headquarters Staff Planning	Headquarters Staff Resource	Headquarters Staff Legislature					
a. Identify information sources												
b. Identify potential impacts												
c. Identify related studies												
d. Identify existing regulations												
e. Identify agencies to contact												
f. Evaluate												
g. Short/long term impacts												
h. Document	X		X		X							
i. Tracking and Control					X							

The EIS/EAR is an end product document. The tasks to develop the EIS/EAR are not used independently of the resultant document. The document itself is used as a primary references for tracking and evaluating the activity as it progresses to assure compliance with the environmental and engineering restrictions and findings.

Chart 6. Tasks vs User

Chart 7 is a matrix which presents the relationship of the anticipated benefits described in detail in Section 6.15.2.2 to the required ADP capabilities identified specifically in Section 6.15.1.4.1 and generally in Appendix A. The matrix is intended to serve three purposes:

a. To show which ADP capabilities are required by this application area to realize the anticipated benefits

b. To show which ADP capabilities provide the most support in terms of the number of benefits associated with a particular ADP capability

c. Assuming the more anticipated benefits associated with an ADP capability the greater the need for the capability, it can be used as the basis for determining a development schedule.

Chart 7. Benefits vs ADP Capabilities

TASKS	DATA SETS																					
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	Program Plans	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
a. Identify Information Sources																		R				
Select EIS/EAR TEAM																		W				
b. Identify Potential Impacts																		R				
c. Identify Related Studies																		R/W				
Collect Needed Information	R	R	R	R	R	R	R	R	R	R	R	R					R	R/W	R	R		
Prepare Area Description	R	R	R	R	R	R	R	R	R	R	R	R					R	R/W	R	R		
d. Identify existing regulations																		R				
e. Identify agencies to contact																		R				
f. Evaluate Potential Impacts																						
Identify Design mitigations																		R				
Reevaluate Potential Impacts																						
Identify design/operational changes																		R/W				
g. Short/Long term impacts																		R				
Irrevocable resource use																		R				
Alternative approaches																		R/W				
h. Preparing, updating and producing the required EAR/EIS documents:																						
h1. Preliminary Draft Produced and Distributed																		R/W				

Chart 7. Benefits vs ADP Capabilities (Continued)

TASKS	DATA SETS																					
	Vegetation	Soils	Minerals	Geology	Water	Wildlife	Meteorology	Recreation	Cultural	Land	Case	Socio Econ	Accounting	Protection	Manpower & Organization	Payroll	Property	Text	URA	MFP	Program Plans	Budget Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23
h2. Preliminary Draft Modified and Edited																		R/W				
h3. Draft EIS/EAR Produced and Distributed																		R/W				
h4. Draft EIS/EAR Modified and Edited																		R/W				
h5. EIS/EAR produced and distributed																		R/W				
h6. Final EIS Modified, Edited, produced and distributed																		R/W				

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6.15.3 Requirements

6.15.3.1 Introduction

To implement this application package it is necessary to meet certain requirements. These requirements are shown in the following charts which present:

a. The data sets required to apply ADP capabilities to the various EIS/EAR tasks.

b. The inputs required for each task and the suppliers of those inputs.

6.15.3.2 Supporting Charts

Chart 8 is a matrix which presents the data sets described in detail in Table 5-1 and in general in Appendix B that will be used by the application area tasks described in detail in Section 6.15.1.2. The matrix is intended to serve three purposes:

a. To show which data sets are required to execute application area tasks

b. To show how much use is made of a data set by representing the number of tasks within an application area that use the data set.

c. To show how the particular task uses the data in the data set, i.e., just displays the data, (R) adds new data (W) or corrects existing data. (R/W)

The symbols used at the intersections have the following meanings:

R - Indicates that the data in the data set is read, i.e., displayed on a video screen, in a report, etc., but no updating of the data takes place. This is just a visual display of the data for review, auditing, information, etc. For example,

the resource specialist would want to examine previous resource surveys in a paticular area before making a field trip. To do this the various resource data sets are interrogated to determine if a resource survey was performed in the desired area and if so, what information was gathered in each resource category. This could be done initially using a video device and if the information is useful a hard copy could be obtained.

W - Indicates that the data set or a logical record is initially created without immediate review. An audit trail or error listing may be produced as a result of this update but no use is made of the updated data set. For example, a large amount of information may be added to a data set which would involve a time consuming effort to enter, edit and correct each transaction.

R/W - Indicates the data set is:

1. Created or updated and then used to produce a product. That is, the resource specialist enters the field collected data into the data set, makes corrections, if necessary, and the new data is displayed in a report.

2. Read and after some analysis data in the set is updated. For example, the resource specialist, prior to a field trip, could be perusing resource information from a resource area and, because of that specialist's knowledge of the area, fill in missing information.

R/* - Indicates that while reading the data in a data set a conflict with information in a second data set is discovered. No corrective action is taken at this time. For example, if the resource specialist was examining URAs in the secialists discipline and a discrepancy was noted with the previously examined resource inventory data, a field trip would be required before the discrepancy could be corrected.

It should be noted that the symbol used represents the most common usage of a data set by a task. This does not mean however that another function cannot be performed. The common procedure may be to read (R) only, but on occasion a write (W) or conflict reduction (R/*) may be done.

Detailed menus for each data set are found in Phase IV of the report.

Chart 8. Tasks vs Data Sets

ADP CAPABILITIES / BENEFITS	Structured Data Handling			Mapping/ Graphics		Text Processing			Special Processes	Image Processing					Computer Assisted Training		Data Base Conversion	Microfilm	Job Execution		Comments
	Update	Retrieval/ Output: Pre-defined	Retrieval/ Output: Ad hoc	Data Entry/ Modification	Retrieval/Output	Update	Retrieval/Output	Composition		Input	Preprocessing	Pattern Recognition	Image Manipulation	Image Display	Remote	Local			Interactive Online	Batch	
a. Identification of experienced personnel		X																			
b. Identification of impacts, information sources, prior work, secondary impacts		X					X														
c. Uniform and complete mathematical tools									X												
d. Ease of reference to environmental regulations and interested parties list							X														
e. Readily accessible resource and environmental data					X		X														
f. Document editing, update and production ease						X		X													
g. Greater uniformity among results		X			X	X	X	X	X												
h. More complete and up-to-date information					X		X		X												
i. Reduced hardcopy requirements							X														
j. Improved management control		X	X																		

Chart 9 is a matrix which presents the relationship of the application area tasks described in detail in Section 16.15.1.2 to data maintained in other application areas and BLM personnel responsible for supplying application input data. The matrix is intended to serve three purposes:

a. To show which other application areas furnish information to the application area task

b. To show the personnel position titles within BLM which are responsible for providing information to the application area task

c. It may indicate critical application area linkages, which would affect the implementation sequence.

Chart 9. Tasks vs Application Area Inputs and Supplier Responsibility

TASKS	APPLICATION AREA INPUTS															SUPPLIERS								
	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	EAR/EIS	Regional Analysis	Protection	District Resource Staff								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15									
a. Identify Information Sources Select EIS EAR Team																								
b. Identify potential impacts	X	X	X					X	X					X		X								
c. Identify related studies Collect needed information	X	X	X													X								
Prepare area description	X	X	X													X								
d. Identify existing regulations																								
e. Identify agencies to contact																								
f. Evaluate potential impacts	X	X	X					X						X		X								
Identify design mitigations																								
Recirculate potential impacts																								
Identify design/operational changes																								
g. Short/long term impacts																								
Irrevocable resource use																								
Alternative approaches																								
h. Preparing, updating and producing the required EAR/EIS documents:	X	X	X					X						X		X								
1. Preliminary draft produced and distr.																								
2. Preliminary draft modified and edited																								
3. Draft EIS/EAR produced and distributed																								
4. Draft EIS/EAR modified and edited																								
5. EIS/EAR produced and distributed																								
6. Final EIS modified, edited, produced and distributed.																								

6.15.4 Application Package Relationships

6.15.4.1 Introduction

While a package is designed to be implemented without automated dependence on other packages, a relationship will still exist. This section provides the reader with a pictorial portrayal of this relationship.

6.15.4.2 Relationship Chart

Chart 10 is a graphic presentation of package interrelationships. the connecting lines show the flow of the information and the number associated with the line refers to an explanatory paragraph in Section 6.16.

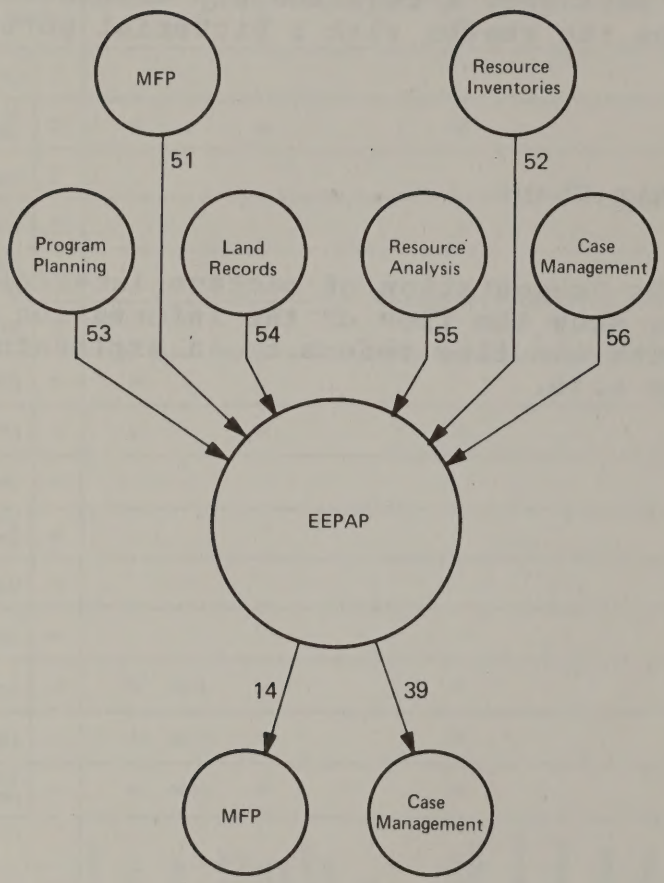


Chart 10. Package Interrelationships

6.15.5 Implementation Options

The major task in implementing the EIS/EAR ADP capabilities will be the development of the various data bases required to support this application package. However, it is not necessary to wait until a data base is complete to have a useable capability. By proper planning and phasing of the data base development the application package capability can evolve from a limited but useable state to a fully implemented tool. There are three basic approaches which can be taken to achieve such an implementation.

a. An area oriented approach where all data of all types required for a specific district or a state are collected, prepared and implemented. The implementation plan in this case would provide the order for considering the various areas.

b. A resource oriented approach where all data of all types required to completely define and produce EIS/EAR documents for a specific resource are gathered, prepared and implemented. The plan in this case would provide the order for considering the various resources.

c. A data set oriented approach where all data required to compllete a specific base of information is gathered, prepared and implemented. The plan in this case would provide the order for considering the various data sets.

In addition an approach could be used which combines some aspects of each of these basic approaches.

For the EIS/EAR applications package it is recommended that an area oriented approach be used and that the order of implementaion be selected based on the anticipated level of EIS/EAR activity in each BLM district or state.

The area oriented approach has been chosen because the EIS/EAR documents are basically area oriented. These documents do not specifically concentrate on any one resource or any one type of data, but, considers the total impact on all facets of the environment of a particular action. By phasing the data base implementation in order of the location of the anticipated EIS/FAR activity the greatest need would be met at the earliest possible time.

The text data base does not lend itself completely to this approach. There will be many documents in the text data base which will be area oriented, however, the majority of the information does not fit into either the area or resource category. However, the text data base need not be complete to be useable. As reference material is identified it can be added in to the text data base and become immediately available to the EIS/EAR preparation teams.

6.16 APPLICATION PACKAGE RELATIONSHIPS

The data relationships of one application package to others is an important aspect in the development of an integrated information system by BLM. The relationships identified to date are presented in Chart 1 and are described in detail in the subsequent paragraphs. An analysis of these relationships and how they might be used to assist in assigning priorities to the application packages was performed. The results of this exercise are summarized in Chart 2 and the methodologies utilized are explained.

6.16.1 Application Package Relationships Descriptions

The purpose of Chart 1 and the supporting narrative is to clearly display facts established during the early stages of the Strategic Plan study effort. This is that:

a. an integrated BLM information system has a large number of application interrelationships.

b. removing an application from the system also removes the integrated nature of the system and the benefits which are realized from that integration.

By reading down a column of this matrix, the application areas which provide support to the application being considered are indicated by a number recorded at the intersection with a row. For example, looking at the column titled Resource Inventory, the matrix shows that the Resource Inventory application needs support from the Lands Records Management application. The number 1 at the intersection is the key to a narrative paragraph on the following page which gives a detailed explanation of that relationship.

By reading across the rows of this matrix, application areas which are supported by the application being considered are indicated. For example, looking at the row titled Planning: URA, the matrix shows that the Planning: URA application provides direct support for the MFP and Program Planning applications.

	Resource Inventory	URA	MFP	Program Plans	AWP	Accounting and Fund Control	Payroll	Land Records	Case	Utilization	Manpower & Organization	Property	Protection	Regional Analysis	EAR/EIS
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Resource Inventory		2 R			21 R				33 R				46 R		52 R
2. Planning - URA			8O/R	16 O											
3. Planning - MFP				17 R					34 O				47 O		51 O
4. Program Planning		6 O			22 O						42 R		47 O		53 O
5. AWP and Program Mgmt.				18 R		26 O						44 O			
6. Finance: Accounting and Fund Control				43 R	24 R 21 R				36 R	40 R		45 O	48 R		
7. Finance - Payroll						27 R							48 R		
8. Lands Records Mgmt.	1 O	3 R	9 O						37 O						54 O
9. Case Mgmt.		7 O	15 R			35 O		31 R		41 R					56 O
10. Utilization Mgmt.			10 R	57 R		29 R		32 O							
11. Manpower and Organization Mgmt.				19 R	23 O								49 R		
12. Property Control and Mgmt.		4 O	11 O		25 O	28 O							50 O/R		
13. Protection			12 O			30 R									
14. Regional Analysis		5 R	13 R	20 R					38 R						55 R
15. EAR/EIS Preparation and Publication			14 O						39 O						

Chart 1. Application Interrelationships

The narrative paragraphs numbered 8 and 16 explain the relationships in detail.

The letter O or R which is recorded for each application interrelationship tells whether automated support for the interrelationship is optional (O) or recommended (R). This decision is based on the following several factors about the relationship:

a. Frequency the interrelationship is needed

b. Volume of data passing between the two applications

c. Number and geographic proximity of application area users

d. Current Bureau policy as to the organizational responsibility (centralized/decentralized) of the two applications

e. The extent to which current procedures satisfy application interrelationship requirements

f. The dynamic/stable nature of the data which passes between the two applications

g. Geographic dispersion of data sources.

Given a more detailed requirements analysis study than feasible within the scope of the conceptual level of the Strategic Long-Range Plan, the optional/recommended decision about any interrelationship could change. The optional/recommended decisions recorded in the following relationship narratives reflect:

a. Study Team interpretation of the level of data collected in this study

b. Individual Bureau experience of Study Team members. Personal experiences of other Bureau personnel may result in different opinions as to all recommended or optional nature of an interrelationship.

1. The resource Inventory application requires the following information maintained in the Lands Records Management application for the Field Collection Planning task:

a. Ownership status

b. Survey information

c. Land utilization information.

Automated support for this application interrelationship is optional. Person-to-person communication between the District and State Offices or a trip to the state office to see the MTPs will satisfy this infrequently used requirement.

2. To provide a comprehensive URA, access to resource data is a prerequisite. In preparing a URA frequent references to resource data are required. The problems (Section 6.2.1.3) and proposed benefits (Section 6.2.2.2) of the URA application package place much emphasis on the need for faster access to more accurate data.

Implementation of the structured data handling capabilities in the Resource Inventory application (which is the application area that moniters the various resource data files) for those resource areas being considered for URA package implementation will be the fist step in providing the faster access and the tool to support more accurate, up-to-date data.

3. Iands Records Management package has much of the data required for a URA such as:

a. Land use status

b. Ownership status

c. Survey information

d. Physical improvement locations

e. Legal access data.

Because of the dynamic nature of land use data, it is very difficult to complete or maintain a URA, especially the Lands URA, without faster access to up to date data.

Development and implementation of the structured data handling capabilities as applied to the Lands Record Management application package provides the faster access to the Lands data required for a URA.

4. The Unit Resource Analysis application requires the following information maintained in the Property Control & Management application:

a. Roads & trails

b. Major physical improvements.

These are considerations in describing the current resource condition.

The interrelationship is optional. The information is stable and the required volume and frequency of reference is low enough that the cost of implementing automated support from the Property Control & Management application just to support URA needs does not justify automating the relationship.

5. The URA requires a high volume of Regional Analysis data such as:

a. Regional land use classification for the current Lands situation

b. Economic forces behind current resource utilization levels

c. Supply of resources outside BLM

d. Demand data to assist in determining opportunity for development

e. People influence zones

Because of the dynamic nature of social, economic and political data and and the large volume of available data, it is very difficult to maintain a URA without faster access to up to date Regional Analysis data. Implementation of the structured data handling capabilities in the Regional Analysis package for those resource areas being considered for URA package implementation is recommended to satisfy the large volume and high frequency of

Regional Analysis data references and to provide a tool for simultaneous reference by multiple URA preparers.

Implementation of the text processing retrieval capability in the Regional Analysis package is optional. However, district access to a centralized, up-to-date reference/abstract system of economic, social and political studies and research could provide the source for a more comprehensive URA.

6. Historical information from past detailed activity plans, maintained in the Program Planning application area, provides a good source for predicting the effect of proposed treatments on the resource condition. Automated support for the URA/Program Planning relationship is optional to the degree that predictive accuracy is needed on treatment area proposals. If high accuracy is required, it is recommended to develop and implement at least the structured data handling capability in the Program Planning package to support URA resource potential analysis since manual manipulation and analysis of the large volume of historical statistical data involved in activity plans is impractical.

7. The mineral status overlay in the Minerals URA requires current minerals claim data which is maintained in the Case Management application area.

Volume and frequency of requests for such information for URA purposes is too low to justify implementing any Case Management package processes just to support the URA requirement.

8. The following Information from the URA package is necessary for MFP optimum use and multiple use recommendations:

a. Resource capabilities and opportunities

b. Resource condition and trend

c. Time limit information for arresting resource deterioration

Automated support for this relationship to improve access and URA data accuracy is optional to the extent that the required information is manually accessible within the District Office.

Automated support for URA prior to implementing the MFP package is recommended to the degree that the URA information quality is

at an inadequate level due to the limitations of manual preparation and maintenance.

9. The MFP process has the following information requirements which are related to the Lands Records Application area:

a. Data to determine need for survey/resurvey

b. Current rights-of-way and easements for determining Roads and trails support recommendations.

Automated support for this package interrelationship is optional to the extent that the District Office has timely access to that information using person-to-person communications with the State Office.

10. The MFP process has the following information requirements which are related to the Utilization Management application area:

a. current land utilization

b. resource production statistics.

This data is voluminous and dynamic. Implementation of the structured data handling capability for utilization monitoring tasks is recommended:

a. To provide timely, adequate access to use production statistics

b. To provide a tool for increasing the accuracy of land use and use production statistics.

11. The MFP application requires the following information maintained in the Property Control and Management application:

a. Existing roads and trails

b. Existing buildings and yards.

These are considerations in determining any additional need for MFP support recommendations. Automated support for this relationship is optional. The information is fairly stable and the required volume and frequency of reference is low enough that the cost of automating support for this relationship is too high

to justify implementing any Property Control and Management package options just to support this MFP requirement.

12. Information on current fire prevention and presupression efforts from the Protection Application area is needed to complete MFP support recommendations. Automated support for this MFP/Protection package relationship is optional to the extent that the required information is manually accessible within the District Office.

13. All multiple use alternatives must be considered in terms of social, economic and political implications. The district management profiles maintained in the Regional Analysis application area are the source for these considerations. Because of the:

a. Dynamic nature of the data

b. Large volume of data available

d. Diverse locations at which such data many be found.

it is very difficult to relate the social, economic demographic and political factors to the MFP on a manual basis. Implementation of the structured data handling capability in the Regional Analysis application package is recommended. Implementation of the text processing capability is recommended to provide a centralized, up-to-date reference abstract system of economic, social and political studies and research to provide an easily used tool for a more comprehensive MFP.

14. The MFP task of analyzing multiple use alternatives requires information regarding

a. Interagency commitments

b. Land management plans of other agencies and private organizations which could affect BLM progam planning.

Good sources for this information are the environmental reports and impact statements prepared by all groups who have plans which affect the environment in any way. Maintencne of this information is to be a function of the EAR/EIS Preparation & Publication application package.

Automated support for the MFP/EAR-EIS relationship is optional to the extent that manual access to appropriate environmental reports from the District Office is available and adequate and MFP preparers have sufficient time to read appropriate reports to obtain pertinent facts.

15. An MFP must take into consideration potential land utilization. Pending use applications, maintained in the Case Management application are a main source of information regarding potential land uses. Because such information is:

a. Voluminous

b. Dynamic

c. Hard to trace on a manual basis.

It is recommended to implement the structured data handling capabilities for the case flow monitoring tasks in the Case Management application. This will help create a more comprehensive optimum use recommendation for the MFP.

16. Reference to URA resource capabilities and opportunities for development in determining proposed investment locations of program activity plans is frequent. To the extent that this URA information is manually accessible to the Program Planner on a timely basis, automated support is optional for this URA/Program Planning relationship.

17. There is a substantial requirement for the following MFP data in preparing detailed activity plans:

a. MFP decisions which provide the basis for estimating the range of action needed to meet program objectives

b. The basis for multiple-use program activity plans is the MFP

c. MFP fire protection support requirements are the basis for the District Fire Zone Plans

d. MFP roads and trails support requirements are the basis for the District Transportation Plan.

Automated support for this relationship is recommended for the following reasons:

a. The amount of MFP data referenced in completing a detailed activity plan is large

b. Program planning is a continual refining, updating job so the frequency of MFP/activity plan interaction will be high

c. Many resource specialists are involved in activty plan preparations during the same time frame.

18. A basic activity plan input is the ongoing programs and existing project locations and investments maintained in the Annual Work Planning and Program Management application. The man months and dollar data maintained in the Operating Budget provides a good base for the quantification process required in preparing and updating activity plans.

Automated support for the Program Planning/AWP relationship is recommended because:

a. The amout of AWP and Program Management data usable in preparing a detailed activity plan is large

b. The man-month and dollar figures in the AWP are directly transferable to program planning process which establish the first cut at quantification

c. Program planning is a continual referring, updating job so the frequency of Program Planning/AWP interaction will be high.

19. As alternatives are considered and decisions are made throughout the Bureau planning cycle, management needs to know:

a. Current personnel resources

b. Skills mix

c. Location of personnel resources and skills.

Current Bureau policy maintains manpower and organization management as a centralized function while Program Planning is a

decentralized function. In order to provide program planners timely access to personnel information it is recommended that automated support for the Program Planning/Personnel resources be developed.

20. Program planning requires a substantial amount of the following social, economic, political and demographic information.

a. Information on the local and regional economy

b. Supply of resources outside BLM

c. Demand data to assist in defining future local and national need

Because of the:

a. Dynamic nature of social, economic and political data

b. Large amount of data available

c. Diverse locations where such data can be found.

it is recommended to develop automated interactive structured data handling support for the Program Planning/Regional Analysis relationship.

21. Once historical data is available from the Resource Inventory application and from the Accounting and Fund Control application, it will be possible to perform program management and monitoring in terms of investment pay-off cycles, i.e., reforestation expenditures (from Accounting and Fund Control) from budget approved portions of the Forestry program (from AWP and Program Management) to increase timber production (as documented by successive timber related resource inventories).

If investments pay-off cycles are seen as important to Bureau goals, it is recommended to provide automated support for this application relationship because:

a. Currrent Bureau policy has established Accounting and Fund Control as a centralized (at the Service Center) function while Resource Inventory is a decentralized

(each District Office) function. These scattered data sources are not readily merged on a manual basis.

b. Coordinating the large amount of historical resource, financial and annual plan data and analyzing it for program pay off cycles is not a practical exercise if done manually.

22. Program objectives, input actions, priorities, schedules and cost estimates are a basis for the AWP Advices. To the extent that the outputs of the Program Planning application are manually available when needed to the annual work planners, automated support of this application interrelationship is optional.

23. Staffing levels and position structure requirements must be fully documented during Annual Work Plan preparation. The basis for this documentation is the current Table of Organization (T.O.) which is maintained in the Manpower and Organization Management application area. To the extent that an up-to-date T.O. is available as needed to the AWP preparer, automated support for this application interrelationship is optional.

24. Equating fiscal year money expended (maintained in the Accounting and Fund Control application) with fiscal year program objectives of the approved annual work plan (Operating Budget) provides the basis for documenting issue oriented status requests. If issue-oriented status information is seen as important to meeting Bureau goals, it is recommended to provide automated support for this application interrelationship, because:

a. Current Bureau policy has established Accounting and Fund Control as a centralized function (at the Service Center). Program management responsibilities are distributed throughout the Bureau. Issue oriented status requests all filled mainly from Washington Office. These scattered sources of responsiblity are not efficiently merged on a manual basis.

b. The majority of these ad hoc requests request response within hours. Coordinating the diverse data to fill these requests manually within hours is usually not possible.

25. The Property Control and Managment application area is the source of information regarding currently available equipment for consideration in creating the Capitalized Equipment Needs List. To the extent that an up-to-date equipment listing is available on a manual basis as needed to the AWP preparer, automated support for this application relationship is optional.

26. The establishment of financial accounting records for a fiscal year is based primarily on the programs and projects in the approved Annual Work Plan. To the extent that AWP data is readily available to the financial managers on a manual retrieval basis, automated support for this application interrelationship is optional.

27. Payroll costs (including leave values obligated and other Federal obligations to the employee) are a standard account in the Accounting and Fund Control application area. Automated support for this applications interrelationship is recommended, because:

a. There is a high volume of information transferred from the Payroll to the Accounting application

b. There is a high frequency of information being passed from the Payroll to the Accounting application.

28. The Accounting and Fund Control application requires the financial data (purchase price, maintenance costs, etc.) from capitalized, non-capitalized and stores purchases which are part of the Property Control and Management application. To the extent that passing this financial information from Property to Accounting can be done in a timely manner on a manual basis, automated support for the application interrelationship is optional.

29. Bureau income data from lease fees, license and permit fees, sales prices, etc., is part of the stipulation data in the Utilization Managment application. The financial aspects of this information are passed to the Accounting and Fund application for the Accounts Receivable, Collections and Distribution of Receipts processes. Several characteristics of this application interrelationship indicate that automated support be recommended. These are:

a. The volume of data passed from the Utilization Management to Accounting and Fund Control is high

b. The frequency of the transfer is high; it is also irregular depending on conditions laid out in each lease, permit, etc.

c. Utilization Management is a decentralized function (done at all State and District offices) while Accounting, within current Bureau policy, is centralized (done at the Service Center).

30. Fire suppression and rehabilitation costs originate in the Protection application area, but are transferred to the Accounting and Fund Control application for financial accounting requirements. Two characteristics of this application interrelationship indicate that support for the transfer of financial data from Protection to Accounting be automated. These are:

a. The volume of data passed and the frequency are both very irregular. During the peak of a fire season, the volume and frequency is so high that manual means of data transfer from one application to the other are not adequate.

b. Responsibility within the Protection application is mainly decentralized while the Accounting Control function is highly centralized. This condition makes coordinated, effective manual transfer of data from one application to the other difficult.

31. The following data from various tasks within the case Management application are used to update the data maintained in the Lands Records Management application:

a. Utilization application actions

b. Lease/permit termination actions

c. Withdrawal application and terminations

d. Classification applications and terminations.

Automated support is recommended for this application interrelationship for the following reasons:

a. The frequency and volume of Land Records update from Case Management data is high

b. The plat update procedure required from each Case Management action requires extensive time to perform manually relative to the amount of time which would be required with automated graphics update support.

32. Data from changes to approved permits, leases, etc., maintained in the Utilization Management application sometimes require update to the Lands Records. To the extent that such changes are low volume, low frequency and can be manually processed on a timely basis, automated support for this relationship is optional.

33. Current resource status information is needed for every use application that is processed. Depending on the currency and intensiveness of the applicable resource information, some level of field examination, a task in the Case Management application, will be scheduled. Automated support, (at least implementation of the structured data handling capabilities) for Resource Inventory/Case Management application interrelationship is recommended, because:

a. The frequency of resource data referenced during Case Management application processes is high

b. The volume of applicable resource data referenced prior to field examination is limited only by the amount available

c. Resource inventory processes are decentralized functions at each District Office while Case Management processes are centralized at the State Office. These scattered responsibility areas are not efficiently merged on a manual basis.

34. Optimum use decisions, a process in the MFP application, can be used to guide Case Management application decisions. To the extent that this MFP information is manually accessible to persons responsible for use application processes, automated support for this application interrelationship is optional.

35. Accounts monitoring processes in the Accounting and Fund Control application need notification of fees collected during use application processes in the Case Management application area. To the extent that passing this financial information from Case Management to Accounting and Fund Control can be done in a timely manner on a manual basis betweem the District Office and the Service Center, automated support for this application interrelationship is optional.

36. Fee collection information from the application filing process relies on Accounting and Fund Control application process for support, because:

a. The frequency and volume of application fees to be processed is high

b. Accounting functions are centralized at one Service Center while Case Managment functions are decentralized (at each State Office).

automated support for this applications interrelationship is recommended.

37. The relationship between the Case Management and Land Records application areas is basic. Data maintained bv the Lands Records functions is referenced

a. To determine if the area under consideration is currently being utilized

b. To reveal the ownership of adjoining land and the nature of the surrounding utilization environment.

This is done to determine any conflict between the application, land resources and use. Since these two processes are both State Office functions, automated support is optional to the extent that Lands Records data is accessible manually in a timely manner.

38. Information maintained in the Regional Analysis application area provides the sociological, economic and demographic nature of the surrounding area to assist in determining what inpact user renewal or initial application approval will have in the area. Because of the:

a. Dynamic nature of the data

b. Large volume of data available

c. Diverse locations at which such data may be found.

it is difficult to relate social, economic and political factors to a use application on a manual basis. Development and implementation of text retrieval capabilities for the Regional Analysis package is recommended to support this applications interrelationship. It will provide a centralized, up-to-date abstract referencing system of economic, social and political studies and research that can be used to assist in a land use application or renewal decisions.

39. Any proposed land use requires an environmental analysis report or a full impact statement, depending on the nature of the proposed use and the land involved. Preparation and publication of the environmental report is required by law before a land use application decision can be made. To the extent that the contents of the environmental report are manually available to the decision maker on a timely basis, automated support for the Case Management/EAR-EIS relationship is optional.

40. Utilization income originates in the accounting control processes in the Accounting and Fund Control application area. The utilization application area relies on communication from the accounting application for the receipt of use fees in order to update use status. Several characteristics of this applications inter-relationship indicate that automated support is recommended. These are:

a. The volume of data passed from the Accounting and Fund Control application to the Utilization Management area is high

b. The frequency of the transfer is high; it is also irregular depending on payment conditions laid out in each lease permit, etc.

c. Utilization Management is a decentralized function (performed at all State and District offices) while Accounting within current Bureau policy is centralized (done at the Service Center).

Automated support for this relationship would provide the following benefits:

a. A more up-to-date status picture would be available

b. The billing and notification of payment functions would be improved thereby improving customer/operator relations

c. Man-hours would be saved by eliminating manual postings of use status.

41. A decision in favor of a proposed use, the final task in the Case Management application, provides the data for initialization and maintenance of a Utilization Management record. Because of:

a. The decentralized nature of utilization management functions (district responsibilities) relative to the centralized nature (state office) of case management

b. The critical, one-for-one relationship between an approved use decision from Case Management and the record generated in Utilization Management

c. The high volume of data and frequency of cross-reference within these application areas.

automated support for this application interrelationship is recommended.

42. As alternatives are considered and decisions are made throughout the Bureau's Planning cycle, Personnel Management needs to know:

a. personnel resources required from program proposals

b. skills mix required from program proposals

c. location of proposed personnel resources and skills.

Current Bureau policy maintains manpower and organization management as a centralized function while Program Planning is a decentralized function. In order to provide Personnel and Position managers timely access to program proposal data,

automated support is recommended for the Program Planning/Personnel interrelationship.

43. Historical cost data from the Accounting and Fund Control application package provides the basis for predicting costs (which may include statisical means of estimating the inflation factor) in the three out-years, the Program Year and Budget Year. Assuming that program cost estimating based on historical cost data is a valuable Program Planning exercise, automated support for the Accounting/Program Planning relationship is recommended because:

a. The volume of historical cost data available is high

b. Accounting functions are centralized at the Service Center while Program Planning functions are performed at all Bureau levels

c. Predicting future costs based on history and including a statistically sound inflation factor involves complex mathematical operations best performed with electronic equipment.

44. The approved Equipment Budget, a product of the Annual Work Planning and Program Management application, provides a basic input to the Property Control and Management application which is accountable for maintaining an inventory of capitalized equipment and is responsible for initiating equipment purchase orders.

To the extent that the approved Equipment Budget is available as needed by property managers on a manual basis, automated support for this application interrelationship is optional.

45. The Property Control and Management application relies on processes in the Accounting and Fund Control Application to establish and maintain financial accounts of property expenditures. To the extent that passing this financial information between the two applications can be done manually as needed, automated support for this application interrelationship is optional.

46. Resource Inventory package will provide the Protection package with information on what resources will be affected by fire or pest infestation. This information will be used to determine how to fight the fire or pests, and to weigh the

benefits of suppression against the value of the resources threatened. Two factors indicate that automated support for this application interrelationship be recommended. These are:

a. The volume of resource data referenced is high; limited only by the amount of data available

b. Quick access to information may be required in the fire management area more than in most of the Bureau's functional tasks.

47. Fire protection support requirements, maintained in the MFP application area are the basis for the districts' Fire Zone Plans (maintained in the Program Planning application area) which provide the guides for fire management. To the extent that the appropriate MFP and Program Planning data is available manually as needed, automated support for this application's interrelationship is optional.

48. Financial Management Accounting and Fund Control provides personnel, stores and equipment fire cost statistics necessary in assessing effectiveness of suppression efforts. Payroll application area processes provide man-month and dollar/man information that is also used in the calculation of fire management and pest control cost effectiveness. Two factors indicate that automated support for this application interrelationship be recommended. These are:

a. Accounting and Payroll responsibilities are centralized at the Service Center while fire effectiveness analysis is a decentralized, district, responsibility. This makes manual aggregation of the two separate type of data difficult.

b. A large volume of fire statistical data is available which makes manual manipulation unwieldy.

49. The Protection application area relies on the Manpower and Organization Management application for the following kinds of information:

a. Personnel data for commitment determinations

b. Available skills in fire management

c. Location and available personnel with appropriate skills

Two factors indicate that automated support of this applications interrelationship be recommended:

a. Quick access to information is required in fire management more than in most of the Bureau's functional tasks

b. Personnel management is a centralized, Service Center function while fire management is at all district sites.

50. The Protection application area relies on Property Control and Management for maintenance of Store and equipment inventory. This data is used in the:

a. Planning phase of presuppression

b. Commitment determination during suppression

c. Rehabilitation planning

d. Post-suppression utilization and damage assessment.

To the extent that this information is available manually when needed, automated support for this application interrelationships is optional. Commitment determination during suppresion may require automated support for the interrelationship for the same reasons as indicated in the Protection/Manpower interrelationship (see paragraph 49).

51. Contingency alternatives and optimum use recommendations maintained in the MFP application area provide a solid data base for preparation of impact studies. Automated support for this relationship is optional to the extent that the MFP contingency alternative and optimum use information is manually accessible when needed.

52. Information on existing resources, maintained in the Resource Inventory application area, is a basic requirement to any environmental report to analyze the impact to the proposed action on the area. Two factors indicate that automated support for this application interrelationship be recommended. These are:

a. Personnel assembled for generation of an environmental report usually work out of Denver while the area under consideration may be anywhere within the Bureau's domain. Manual centralized access to appropriate decentralized resource data is tedious, incomplete, and time consuming.

b. The volume of applicable resource data is limited only by the amount available for the area being studied. Given an adequate resource inventory, the volume could be too much for manual access and manipulation.

53. The Program Planning application provides information on planned management of an area over a five-year period. This planning information is a basic input to an environmental report. To the extent that Program Planning data is manually accessible when needed, automated support for this interrelationship is optional.

54. The Land Records application area supports preparation of environmental reports with the following information:

a. Ownership status within the impacted and surrounding area

b. Survey information

c. Land utilization information.

To the extent that Lands Records data is manually accessible when needed, automated support is optional. (The optional determination can become "recommended" depending on the criticality of the environmental report and/or the acreage (volume) of land being studied.)

55. Information maintained in the Regional Analysis application area provides the sociological, economic and demographic nature of the impacted and surrounding area. Because of the

a. Dynamic nature of the data

b. Large volume of data available

c. Diverse locations at which such data may be found

it is difficult to relate social, economic and political factors to the impacted area on a manual basis. Development and implementation of text retrieval capabilities is recommended to support this applications interrelationship. It will provide a centralized, up-to-date abstract referencing system of economic, social and political studies and research that can be used to assist in preparing a comprehensive environmental analysis.

56. The Case Managment application area provides information on uses planned for the area under consideration which may have a large/small environmental impact. To the extent that this information is manually available as needed, automated support for this EAP-EIS/Case Management interrelationship is optional.

57. Historical data in the Utilization Management package can be used to determine trends in public land utilization. Having identified any trends, manpower and funding requirements can be predicted for Program Planning requirements. Assuming that utilization trend analysis based on historical utilization data is a valuable Program Planning exercise, automated support for the Utilization/Program Planning relationship is recommended because:

a. The volume and kinds of available historical utilization data is high

b. Trend analysis based on history involves complex mathematical operations not easily performed manually.

6.16.2 Analysis of Application Package Relationships

On the following pages, ten methods for prioritizing application package development/implementation shcedules are described. All methods are based on the 57 application interrelationships detailed on the preceding pages. Two facts should be understood regarding this analysis:

a. Development/implementation priorities within a single application area are not being considered here. In a conceptual study as the Strategic Plan, prioritization of the hundreds of application sub-packages and task

interrelationships before geographic and program priority considerations are known is impractical.

b. These ten methods can be used as development priority guidelines (the data processing technical processes required to provide ADP support for application package procedures) or as implementation priority guidelines (assuming data processing technical processes have been developed, installation of these processes based on BLM geographic or program considerations)

The results of this analysis are presented in Chart 2.

6.16.2.1 Prioritization Methods

1. One method to determine development/implementation priorities is to rank each application according to the number of applications it supports. The logic behind this method is that the more use which can be made of any application, the sooner that application should be developed/implemented. The figures in column 1, chart 2, summarize the total number of applications supported by each application. The figures in column 7 show the development/implementation priority based on column 1 data.

2. Another method to determine development/implementation priorities is to rank each application according to the number of applications it supports which have ADP support recommended for the interrelationship. The logic behind this method is that (a) the fewer recommended ADP-supported interrelationships which exist, the less complex development/implementation of that application package will be (b) less complex packages should be developed/implemented before more complex packages. The figures in column 2 summarize the number of applications supported by each application where ADP-support has been recommended. The figures in column 8 show the development/implementation priority based on column 2 data.

Chart 2. Application Prioritizations

APPLICATION	RESULTS																
	Number of Applications Supported – Total	Number of Applications Supported – ADP Recommended	% (Column 2/Column 1)	Number of Applications Required for Total Support	Number of Applications Required for Support – ADP Recommended	% (Column 5/Column 4)	Priority Based on Column 1 Data	Priority Based on Column 2 Data	Priority Based on Column 3 Data	Priority Based on Column 4 Data	Priority Based on Column 5 Data	Priority Based on Column 6 Data	$\Sigma \frac{\text{(Columns 7–12)}}{6}$	Priority based on Column 13 Data	Study Team Prioritization	BLM Functional Prioritization	$\Sigma \frac{\text{(Columns 14–16)}}{3}$	Priority Based on Column 17 Data
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Resource Inventory	5	5	100	1	—	—	3	13	15	3	1	1	6	4	2	2	2-2/3	2
2. URA	2	—	—	6	2	33	13	1	2	10	7	5	6-1/3	5	6	3	4-2/3	3
3. MFP	4	1	25	8	3	37.5	9	4	6	15	11	7	6-2/3	8	8	4	6-2/3	5
4. Program Planning	5	1	20	7	6	86	3	4	4	9	15	13	8	10	9	5	8	8
5. AWP and Program Management	3	1	33	5	2	40	10	4	7	8	7	8	7-1/3	9	10	6	8-1/3	10
6. Accounting and Fund Control	6	5	83	6	3	50	1	13	12	10	11	10	9-1/2	14	14	13	13-2/3	14
7. Payroll	2	2	100	0	—	—	13	9	13	1	1	1	6-1/3	5	15	14	11-1/3	13
8. Land Records Management	5	1	20	2	1	50	3	4	4	5	5	9	5	2	1	1	1-1/3	1
9. Case Management	6	3	50	6	3	50	1	11	8	10	11	10	8-1/2	11	3	9	7-2/3	7
10. Utilization Management	4	3	75	2	2	100	10	11	11	5	7	15	9-5/6	15	3	11	9-2/3	11
11. Manpower and Organization Mgmt.	3	2	66	1	1	100	10	9	10	3	5	14	8-1/2	11	12	8	10-1/3	12
12. Property Control and Management	5	—	—	2	—	—	3	1	1	5	1	1	2	1	11	12	8	8
13. Protection	2	1	50	7	5	71	13	4	9	14	14	12	9-1/3	13	13	15	13-2/3	14
14. Regional Analysis	5	5	100	0	—	—	3	13	15	1	1	1	5-2/3	3	7	7	5-2/3	4
15. EAR/EIS Preparation and Publication	2	—	—	6	2	33	13	1	2	10	7	5	6-1/3	5	5	10	6-2/3	5

3. A variation of the method just described and based on the same logic, prioritizes application package development/implementation on the percentage of ADP-recommended support relationships compared to the total number of applications supported. This gives a relative priority of package development/implementation not available using the method described in paragraph 2. The figures in column 3 show the percentage of all applications providing support to other applications as compared to the part of that total where ADP support is recommended. The figures in column 9 show the development/implementation priority based on column 3 data.

4. A fourth technique for determining development/implementation priorities is to rank each application according to the number of other applications which have data/processes necessary to support it. The logic behind this method is that the more application package data/processes that are necessary to effectively develop/implement another application package, the more complex the development/implemenation of that package will be and the lower priority it should have. The figures in column 4 summarize the total number of application packages which contain data or processes that are necessary to support each application. Column 10 figures show the development/implementation priority based on column 4 data.

5. This method for determining development/implementation priorites is to rank the packages according to the number of application packages which have recommended ADP support for processes or data that are necessary to support it. The logic behind this method of prioritization is that if ADP support has been recommended for the relationship, development/implementation of the application is even more complex than that determined by using the fourth method (above). The figures in column 5 summarize the number of application packages which contain data/processes necessary to implement another application package the relationship of which has ADP support recommended. Column 11 figures show the

development/implementation priority based on column 5 data.

6. A variation of the method described in paragraph 5, and using the same logic involves priorities being assigned to the application package development/implementation based on the percentage of recommended ADP-supported interrelationships required to most effectively develop/implement the application compared to all interrelationships (optional and recommended) that would support development/implementation of a package. This percentage gives a relative priority of complexity of package development/implementation not available using absolute values as in paragraph 5. The figures in column 6 show the percentage of total supporting applications compared to the part of that total where ADP-supportive relationships are recommended. The figures in column 12 show the development/ implementation priorities based on column 6 data.

7. The seventh method for determining application package development/ implementation priorities is to compute the average of the first six methods. The logic behind this method is that the average of the six methods will best reflect a priority which gives equal importance to the six previously defined methods. The figures in column 13 are the result of averaging the data across columns 7 through 12. Column 14 shows the development/ implementation priorities based on column 13.

8. The Strategic Plan Study Team has submitted its package development/implementation priorities as indicated in column 15. These priority decisions are based on the extensive operational experience possessed by the BLM members of the study team plus their knowledge of the desired development/ implementation priorities identified during the Site Surveys.

9. Work element relationships as documented by the WER chart (see the Phase I Final Report) display another prioritizing technique for package development/implementaion. Using this method, development/implementation schedules are based on the following WER chart interpretations and resultant

priorities in parentheses to the left of the explanation:

(1) Lands Records Management processes and data provide the basis for all land management jobs

(2) Once the public lands have been identified, the resources (type, quantity and quality) must be identified so that land management jobs and goals can be laid out

(3-7) Planning and management guidelines for operations must be defined and communicated (reflected in priorities 3 through 7)

(8) Operations are carried out by BLM personnel. Therefore, manpower and organization processes must be considered next

(9) The case management application is the basic BLM operation (disposal vs. retention and utilization decisions are included here)

(10) Before utilization decisions can be finalized, EAR/EIS preparation and publication processes must be performed

(11) Utilization Management operations are the next logical priority after an application approval

(12-14) Once utilization management operations are initialized they require administrative processes to sustain them (financial and property management)

(15) Protection (fire management and pest control) is one example of Utilization Management functions and can be performed once all the above processes have been considered.

10. This method for determining application package development/implementation priorities is to compute the average of columns 14 through 16. The logic behind this method is the same as explained in paragraph 7 expanded to include subjective implementation priorities (as well

as the objective rankings documented by methods 1 through 7). The figures on column 17 are the result of averaging the data across columns 14 through 16. Column 18 shows the development/implementation priorities based on the column 17 figures.

6.17 CURRENT SITUATION

6.17.1 Current Situation in Terms of Hardware and Software

Required ADP support in the Bureau of Land Management has more than doubled in the last 3 1/2 fiscal years. Until recently, the Bureau's Division of Data Processing has been able to fulfill the requirements in a batch-oriented, shift environment with reoccurring computer jobs run on a standard schedule and special, ad hoc, requests completed on an as-time-allows basis. This environment is no longer adequate: Data storage and handling capabilities, workload considerations and data communication requirements are factors.

6.17.1.1 Data Storage and Handling

The mass amount of data associated with some of our more recent automated systems - Range, Cadastral Survey Field Notes, Bentonite Claims - cannot be efficiently maintained or referenced using current data storage and data manipulation capabilities. These large data handling and storage requirements added to the annual increases in data bases of our more established systems (personnel, financial management, material sales, etc.), plus Bureau plans for more emphasis on automated support of resource inventories are going to require a data base/data management system that is not supportable by the current ADP configuration.

6.17.1.2 Workload

Information requests are fulfilled by execution of one or more computer programs. The need-to-know has increased in terms of number of ad hoc requests. These cannot be accurately counted since many Bureau personnel who need information out of current systems don't even initiate a request but seek other sources:

a. Cuff records

b. Out-of-date ADP printouts

c. Personal knowledge

c. Estimates

Workload requirements at all Bureau levels are requiring faster turn-around (from initiating a request for information to receipt of that information) than previously. Furthermore, demand for information has increased to the point that the Division of Data Processing has an ever increasing backlog of new development work as well as coordinating requests for ad hoc information reports from systems in maintenance status. The number of 1265s received into the Division of Data Processing has increased significantly over the past three fiscal years.

FY73:	261	1265 requests	
FY74:	375	1265 requests:	30% increase over FY73
FY75:	516	1265 requests:*	27% increase over FY74

Based on 43 requests/month average through 2/3 of the fiscal year.

The following computer utilization figures from FY-71 until FY-74 describe elapsed time that is devoted to application programs, and do not include the overhead time required to load the Master Control Program, libraries and other system functions.

ELAPSED COMPUTER TIME (B-5500)

Month	FY-71	FY-72	FY-73	FY-74	FY-75	Average Annual Increase (%)
JUL	410	625	650	840	915	23.6 %
AUG	400	620	825	775	897	16.6 %
SEPT	410	700	625	790	728	4.9 %
OCT	500	610	640	800	777*	12.2 %
NOV	400	700	680	850	1058*	30.4 %
DEC	360	600	710	625		24.3 %
JAN	390	575	630	840		30.1 %
FEB	360	650	725	830		35.5 %
MAR	370	575	660	800		30.5 %
APR	320	620	750	962		47.6 %
MAY	375	450	790	920		37.3 %
JUNE	490	650	815	784		18.1 %
	4,845	7,375	8,500	9,816		27.7 %
		(52.2%)	(15.3%)	(15.5%)		(15.5%)

*Adjusted to include time on the BOR CYBER. Benchmarks on the CYBER have shown COBOL jobs running up to 15 times faster and FORTRAN up to 300 times faster based on CPU time. CYBER CPU time was multiplied by 10 to estimate B-5500 elapsed time. This should give a very conservative figure.

The trend toward continued annual workload growth is also illustrated graphically on the next page. Elapsed time is the time the program resided in the computer. Since we typically run two or three programs at a time, elapsed time tends to be about 2.5 times "wall-clock" time.

The average annual workload increase is about 28%. The monthly range of one corresponding month to another is minus 12% to a plus 94%. although there is the usual month-to-month variation, these figures show a large overall gain.

Assuming:

a. 6 operating days a week (25 days/month)

b. a 20-hour work-day for the computer

c. average annual increase of 28% in elapsed computer usage time

d. FY-74 elapsed time of 9816 hours as a base

e. maximum available Burroughs elapsed time being 2.5 times "wall-clock" time which is

2.5 x 20 x 25 x 12 = 15,000 hours per year.

We will have reached maximum operating capacity of our current computer hardware before the end of FY 76. This, of course, discounts the fact that no teleprocessing requests are met since the hardware capability does not exist.

6.17.1.3 Data Communications

The current means of transmitting and reciving data, which includes operations such as coding, decoding and validation, is done in the most basic manner, i.e., mail.

The current means for receiving information can be summarized in three steps:

a. Request for information is initiated by completing a Form 1265 and sending it to the DSC, Division of Data Processing. This process taks 3 to 5 days, depending on Postal Service support. The 1265 is usally preceded by a phone call to the computer systems analyst in charge of the application area to determine how to best describe and define the Form 1265 request. This process takes 3 to 5 days, depending on Pastal Service support.

b. Once the Form 1265 is in the ADP division, a determination is made regarding the need for a computer program to be written. If the request does not require a new program, a computer program run request is sent to Computer Scheduling; the process takes from 5 minutes to a day depending on availability of knowledgable staff to make the determination on a new or existing program. If

the request requires a computer program to be written, it takes from 2 to 10 days before the run request reaches Computer Scheduling depending on Division Workload priorities, complexity of the 1265 request and available computer time for program compilation, debugging, and testing.

c. After the computer program run request is in Computer Scheduling, Operations Staff personnel fit it into the computer job schedule, the program is executed and the product, a hard-copy report, is mailed to the requesting site. This step takes one to eight days depending on the priority of the request, the computer schedule and Postal Service Support. In some cases, the information on the report can be transmitted over the telephone from the DSC to the requesting site, reducing the "wait-time" by about three days.

In summary, current means of transmitting and receiving data require a minimum of 4 working days to 23 working days or longer. In view of the fact that the data is current as of the last update, the accuracy of the data in the 1265 product may be as old as 45 days.

Considering the ever increasing work-load and a more concerned Public regarding BLM activities at all Bureau offices, this turn-around time appears to be is no longer acceptable based on Site Survey Comments. Specialists and managers cannot afford to stall planning and resource utilization decisions 1 to 4 or more weeks while waiting for an information request to be fulfilled. It is not necessary with today's computer technology for any Staff to wait weeks for information.

6.17.2 Current Situation in Terms of Bureau Policy

Equipment (hardware and software) inadequacies, operational inadequacies and Bureau philosophy regarding ADP capabilities have led to two traditional Bureau policies creating an unsatisfactory ADP situation.

6.17.2.1 Systems Development By Support Matter or Special Problem Approach

The Bureau's current programming process utilizes the single subject matter or special problem package approach. In line with this process, Data Processing has traditionally been required to respond on a solution-by-solution basis. ADP workloads and budget constriants have not permitted taking the time and manpower away from specific problem solving to allow total top-down analysis of Bureau current and forecasted needs.

Integrated programs and program planning in the BLM requires Bureau planners and managers to be more aware of interdisciplinary impacts. The relatively recent, higher level of world-wide consciousness regarding environmetnal inter-relationships has made the Bureau more aware of the interaction of various land management problems. The parallel need for inter-related, multiple-use solutions has also manifested itself and should be reflected in the interrelated multiple-use ADP support to those solutions, in terms of computerized data handling and reporting systems being inter-related.

Organizational and timing premised for computer systems development in the traditional special-problem and solution approach do not promote integrated, inter-active systems. A current Bureau situation documented during site surveys which illustrates the result of the special-problem approach is the program managers' need to know program investment pay offs -- i.e., what incrase in timber production occurred as a result of reforestation projects in the area and what did the increase cost? Automated support for this information need requires interfacing the Bureau's timber resource inventory system, the Financial Management System and the Program Management system. These three computer systems were developed independently of each other along rather narrow functional lines and were designed to solve specific, separate problems. The systems are not easily interfaced to produce investment payoff data.

The subject-matter approach to problem solving has a drawback besides inability of computer systems developed in such an environment to efficiently interact. Duplication of input data requirements is a characteristic of this approach. The automated inventory systems for Watershed, Range and Forest each require, for the same piece of ground, coding, editing, storing and decoding of the data for BLM state, BLM district, resource area, planning unit, watershed area, geographic state and county and land type codes. This duplication requires much more of a maintenance workload than if it were only coded and stored once.

Continuation of the subject matter approach will magnify the duplication and interfacing problems.

6.17.2.2 Systems Development, Implementation and Maintenance Away From User's Site

When the Bureau's Division of Data Processing was established over 10 years ago, the Bureau-wide applications that were first developed were administered by Bureau staffs centralized at the Service Center -- cost accounting, payroll, personnel. Customer contact was easy and inexpensive, products were not time-critical and mail was an acceptable transmitting medium. As the Division's workload expanded to include computer applications that were to benefit staffs at other sites, the need for contact with the system users was not visible and travel money for such "user relations" has traditionally been in short supply. Some of these more recent applications are:

a. National Fire Danger Rating System

b. Oil Shale Title Clearance

c. OCS Post-sale system

d. North Dakota Minerals Mapping

The customer organizations in these examples are geographically removed from the Service Center and scattered over all BLM State, District and Special Offices. It is highly impractical to develop any effective computer application to support a staff's workload requirements without frequent on-site contact with the users during development (as well as implementation and maintenance phases). It is unlikely that a would-be user will use the computer system if it doesn't satisfy workload requirements.

There is another point in the life of a computer application system that requires user on-site contact. When the system is implemented, a user-training effort is mandatory. This requirement is even stronger when the user hasn't been directly involved in the development phase. If the user doesn't understand how to use the system, the benefits will not be realized.

The third phase of a computer application, system maintenance, also should include user on-site contact. If a computer system is to continue to support known workload requirements, it must undergo periodic evaluations to insure continued usefulness.

Requirements, whether during initial system development or system maintenance, are best defined and understood by on-site contact between the users and data processing personnel.

6.17.3 Site Survey Comments and Analysis on General ADP Situation

The following coments were received during site surveys by the Strategic Plan survey teams. These comments reflect field-level evaluation of deficiencies/inadequacies that cover all operational systems maintained by DSC ADP today.

	COMMENT NARRATIVE	COMMENT SOURCES
1.	Need training in use of ADP printouts	2 State Offices 1 District Office
2.	Need a system for evaluating the need for proposed ADP reports and periodically reviewing need for current reports.	1 DSC office
3.	Need a general inquiry system (such as SURGE). Need a quick query program including optional summary levels.	2 DSC Offices
4.	Evaluation of any ADP report system change should include review by other systems.	1 DSC Office
5.	There should be field input into information and design format for ADP printouts.	1 State Office
6.	Need a list of regular computer programs.	1 DSC Office
7.	Policy guidelines for determining machine processing priorities are needed.	1 DSC Office
8.	The ADP 1265 manual needs to be updated.	1 State Office
9.	ADP reports are too voluminous.	1 State Office
10.	ADP reports are generally too voluminous. Microfiche should cut down weight and size but fiche is not reproducible for distribution.	1 State Office

11. Need to make ADP Printouts responsive to field needs. — 2 State Offices, 1 DSC office

12. Need a standard coding system for reports.

13. Need a system to eliminate repetition of same data elements in different forms and reports.

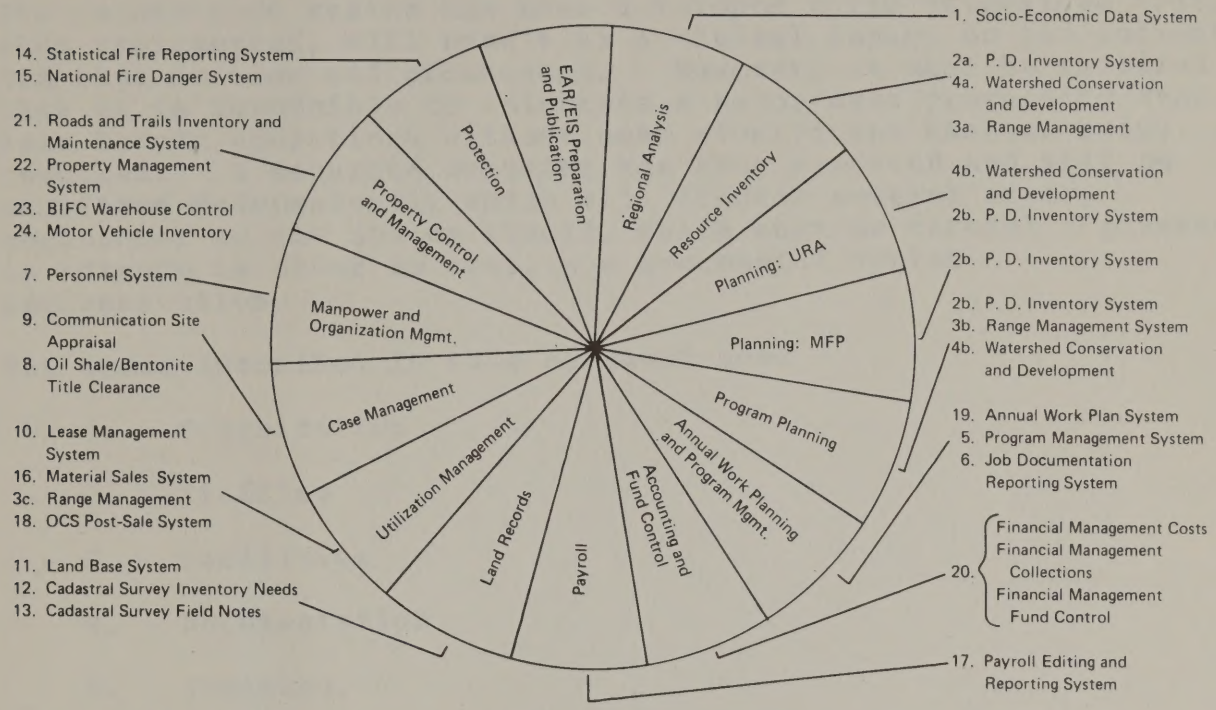
These general comments are indicative of the problems solvable by applying available ADP technology (Section 6.17.1) and the problems solvable by changes in the traditional, unwritten policy for Systems development, implementation and maintenance (Section 6.17.2).

6.17.4 Specific ADP Application Support for Application Area Tasks

6.17.4.1 Overview

The following schematic (6.17.4.2) displays an overview of current ADP systems in relation to the 15 application packages documented in Section 6.1 through 6.15. The identifier associated with each current system refers to a narrative in Section 6.17.4.3 which describes the existing support to an application area.

6.17.4.2 Schematic of Current ADP Support in Relation to Application Areas



6.17.4.3 Details of ADP Support to Application Area Tasks

This section will be inserted into the 2nd draft.

Section 7. IMPLEMENTATION CONSIDERATIONS

The recommended system has been developed using guidelines that, when implemented, will result in a minimal impact on the current BLM organization and procedures. However, it must be realized that it is impossible to integrate a major data processing system into Bureau operations without some significant changes being required. A separate document has been prepared and will be submitted independently which will discuss several areas, peripheral to the system itself, which must be carefully planned in advance in order to realize a successful system implementation.

The areas described in this document are:

1. Organization
2. Staffing
3. Facilities
4. Documentation
6. Training.

The suggestions put forth in this document will be incorporated into the Strategic Plan as they receive management approval.

Section 8. STRATEGIC PLAN

The overall plan for the development of a total BLM information system has been divided into five separate phases. The schedules, the plans, the charts, the costs and the discussions that follow address each phase separately. The estimated length of the total development effort is approximately eight years. The compression of time to eight years is based on the premise that the phases are not implemented sequentially, i.e., at least two phases are in some stage of development at any one time after Phase II initiation.

Phase I

The initial emphasis is on establishing an adequate amount of computing power to address the development of two major BLM functions: data storage and retrieval and text processing. The purchase or rental of a small CPU may quickly lead to saturation and the inherent delays associated with constant upgrading of BLM's computing power. The amount of data, in some ADP format, currently available to the Bureau indicates a need to establish the structured data base as soon as possible. Providing some terminal language for accessing, manipulating, and updating that data base seems to be a logical follow-on activity.

Furthermore, the Bureau prepares, uses and publishes a significant number of documents, reports and forms. The establishment of an extensive text processing system with full editing and formatting capability as well as support for archives and boilerplates would be a valuable asset to BLM's operation.

The availability of storage and retrieval, of interactive query language, and of text processing software products further encourages a plan whereby as much automation is accomplished as soon as possible. The plans and charts that follow consider the initial as well as the future requirements of BLM. They further assume that the Bureau will want to establish as much ADP capability as possible with a minimum of development risk. It is for this reason that a large CPU is recommended with at least one million bytes of storage. In addition, it is recommended that the Bureau obtain as much operational software (software products) as possible. Data storage and retrieval systems, data base management systems, data entry systems, data communications

management systems, control systems, interactive query language facilities, scientific support programs, and text processing packages are off-the-shelf products that can readily support the achievement of BLM's initial goals.

Phase II

The major emphasis of this phase is the establishment of the network. In the initial phase, communication lines and terminals could be installed at the OCS offices and at the Washington, D.C. office. With one leg (CPU to STATE CC to DISTRICT TCU) of the network installed and tested early in Phase II, subsequent, repetitive phase installations could proceed until every state office, district office, OCS office, as well as FSO and BIFC has access to the network.

It is also conceivable that more applications (mission-supportative rather than administrative) could be implemented during this phase. This would, of course, be dependent on BLM priorities and funds. The installation and use of terminals and application programs inevitably leads to further user identification of requirements and further user definitions of applications that could be effectively utilized if installed. The Bureau should remain aware of this and should plan for a contingency of up to 20 man years of effort in addition to the figures discussed in section 8.2.

Phase III

During this phase, further application packages should be installed, tested, and put into operation. This should include the computer assisted instruction packages and the accounting and personnel system.

The full graphic processing and image processing requirements should be considered at this time and any determination to implement them will necessitate the ordering and installing of some form of high capacity storage. The incorporation of that device into the existing system may require some additional software development. That development coding should be done during this phase in preparation for the next two phases where geo-reference data bases and non-coded data from image scanners will consume an inordinate amount of storage.

Phase IV

During this phase, the full graphic capability will be implemented with appropriate software being developed and high resolution graphic terminals and tablets will be distributed throughout the network. It is anticipated that a significant amount of CPU and TCU software support will be required for this phase. The extent of any software development cannot be determined at this time because the technology has not adequately advanced and comprehensive terminal support software packages are virtually non-existent.

Phase V

The plans for this phase are necessarily very vague at this time. It would appear that remote sensing, photographic interpretation techniques, and data extraction techniques (from satellite or aerial photographs) will advance to the point where their usefulness to BLM could be specifically evaluated. See the Phase III Final Report for a detailed description of current and anticipated remote sensing/image processing technologies and their possible application to BLM requirements. Based on available and developing technology, the plans and schedules in Section 8.2 briefly sketch some anticipated development activity. If the Bureau must develop its own software, or contract it out, then the cost of implementation would rise accordingly. If software support packages become available, BLM's cost to implement these capabilities could be significantly less than indicated. It is also possible that direct access to other agency data bases will become available in these last few phases. For instance, BLM may be able to access a BOM data base for mineral resource data or USGS for digitized cartographic data. The Bureau will have to decide what data is available and how useful it may be to the accomplishment of its mission.

8.1 SCHEDULE

The tools selected for setting up a development plan and the plan itself are totally dependent upon the decisions of BLM as to the best way to proceed. The schedules, charts, and discussions that follow are based on numerous assumptions, all of which are subject to change. Selected vendors, BLM priorities, developing technologies may ultimately invalidate these assumptions and the schedules and estimates upon which they are based may lose their effectiveness. The PERT and GANTT charts that follow are aimed at the establishment of a long range plan which best serves the needs of BLM as currently perceived.

The following assumptions are made:

a. The Bureau will purchase rather than develop the following software:

   1. A control system

   2. A data base management system

   3. A data communications management system

   4. A storage and retrieval system

   5. A text processing system.

b. The state-of-the-art technologies in the area of mapping graphics, image data extraction techniques, and cartography suggests that their use be scrutinized and even delayed until product enhancements are incorporated into current product development. For this reason, the Bureau may want to delay full graphic and image processing implementation.

c. The network to be developed is the one which has heretofore been referred to as the "recommended" system.

d. The implementation of full graphics and image processing subsystems will require high capacity storage.

e. BLM will purchase some network software for the CC's and TCU's.

The PERT chart (Section 8.1.1) presents an overall project schedule separated into five phases. The relationships between each of the phases is expressed in the interdependencies of the circles and their associated notations. The timing relationships of this chart may be somewhat distorted. The relationships between activities is more important and the sequence of major accomplishments takes precedence.

The GANTT charts are used to identify significant milestones and durational activities. There is a direct relationship between the due date of certain deliverables (hardware and software) and the beginning and end of some development activity. In addition, the GANTT charts clearly define a period of development. There are five such charts, one for each phase. The period of performance for each and the manpower estimates are as follows:

Phase I	Duration 30 months	Manpower 70 to 100 man years
Phase II	Duration 30 months	Manpower 18 to 25 man years
Phase III	Duration 24 months	Manpower 12 to 20 man years
Phase IV	Duration 22 months	Manpower 8 to 12 man years
Phase V	Duration 33 months	Manpower 14 to 18 man years

It should be clearly noted that the phases may overlap to the extent indicated on the PERT chart.

8.1.1 Overall Project Schedule

The PERT chart that follows is broken down into three main lines of progression. The upper line usually deals with the hardware. The middle area usually deals with software. The bottom line beings with project management and organization. It eventually merges with Phase I education on the beginning of network development.

8.1.2 Schedule Phases

A GANTT chart for each phase of the development and the "pay-offs" associated with each phase are included in the following subsections, 8.1.2.1 through 8.1.2.5.

8.1.2.1 Phase I Payoffs

a. Achieve data control through a centralized data base and data management:

   1. Baseline data

   2. Resource descriptive data

   3. Record keeping - land records, etc.

   Position BLM to where they can determine progress toward desired data base quality.

b. Make data processing facilities more responsing to BLM needs:

   1. Data communications

   2. General purpose software to support ad hoc requirements.

c. Streamline general data dissemination, instruction narrative reports and abstracts to support EIS reference data, special procedures, etc.

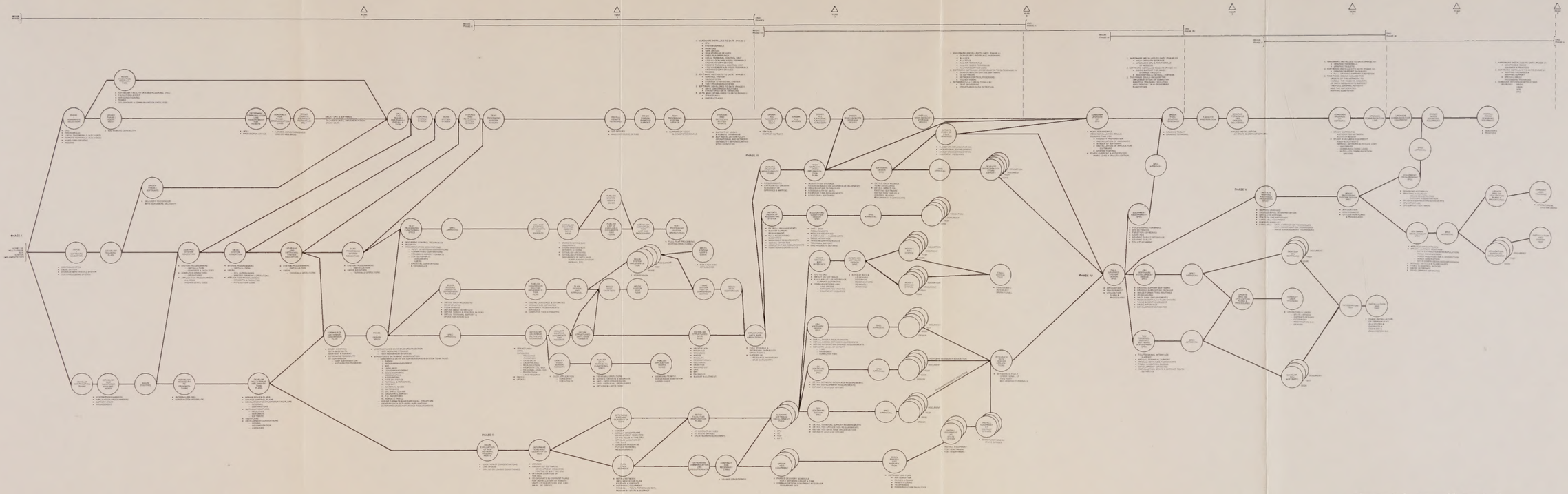
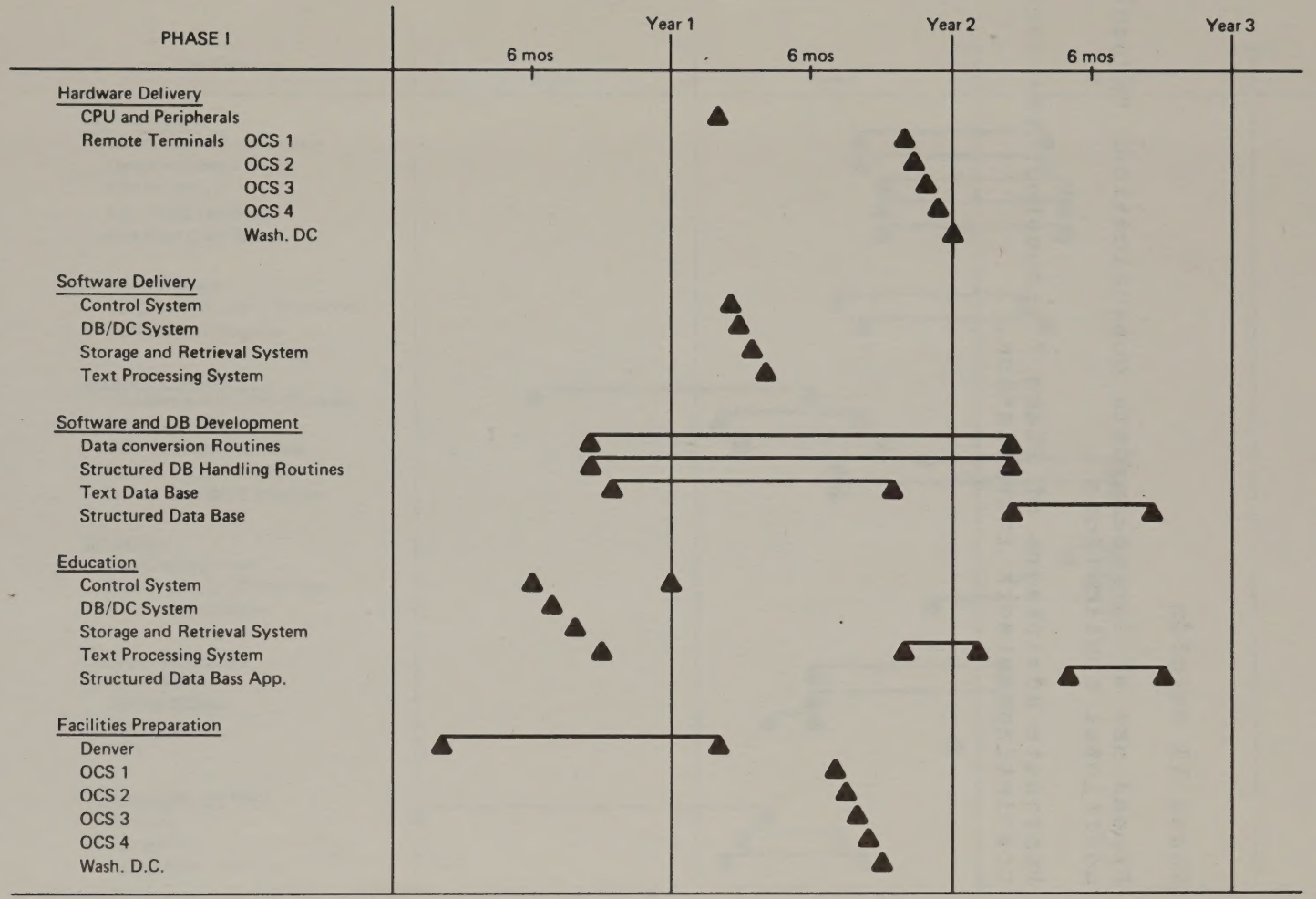


Figure 8-1. Overall Project Schedule

Chart 1. Phase I.



8.1.2.2 Phase II Payoffs

a. Expand use of data base/data communications through additional applications

b. Propagate advantages of Phase I throughout the Bureau by completing network installation.

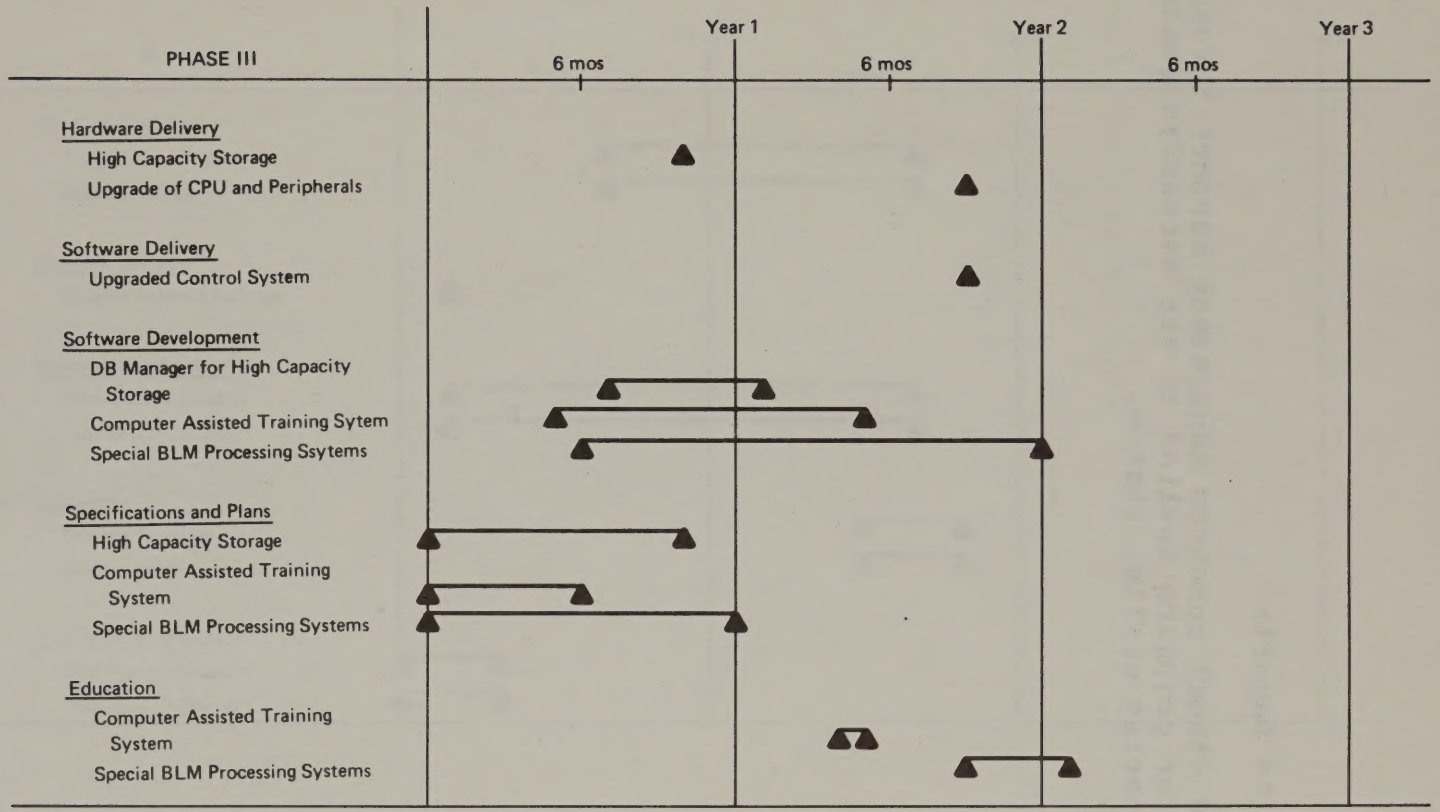
Chart 2. Phase II.

8.1.2.3 Phase III Payoffs

a. Integrated administrative and mission systems to achieve stronger management, accounting, and auditing capability.

b. Improved training through computer assisted instruction.

Chart 3. Phase III.



8.1.2.4 Phase IV Payoffs

Cartography and visual resource management support through advanced computer graphics applied to the extensive resource data base achieved during earlier phases.

Chart 4. Phase IV.

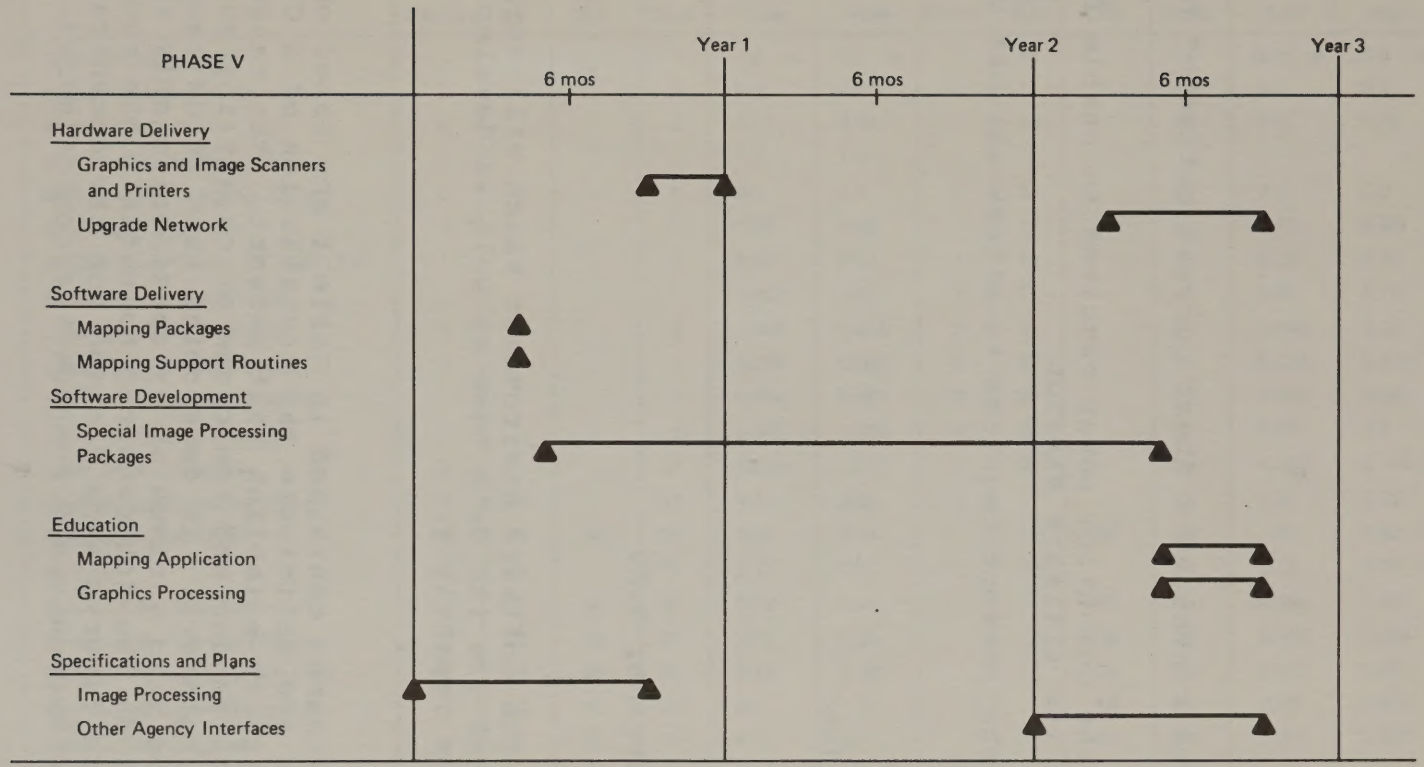
8.1.2.5 Phase V.

a. Total multi-source resource information/management system to include remote sensing and field collected data.

b. Advanced analytical processes to be used for prediction, planning, and management.

c. Strengthen utility of other agency capabilities to BLM through computer to computer connections, e.g., USGS, BOM, etc.

Chart 5. Phase V.



8.2 Cost

The following figures represent a "best current estimate" on the range of costs to:

a. Establish the computing power required to enable BLM to accomplish its ultimate mission

b. Establish the network required to attach all BLM offices to the CPU:

   1. State

   2. District

   3. OCS

   4. ESO

   5. Washington, D.C.

   6. BIFC.

c. Establish the software environment which will enable BLM to build and use its data base as well as develop its application capability.

8.2.1 Hardware

The hardware cost figures contained in Table 1 are based on the recommended network and anticipate the installation of a CPU and peripherals necessary to establish that network. The range of costs vary with each vendor and the range of capability varies with each piece of hardware. In developing this price range, the high and low figures were arrived at by considering only that hardware that could do the job required to satisfy the recommended network. Comparable figures were derived for the decentralized network so that the Bureau could compare the cost figures.

Table 1. Hardware Cost Figures

Equipment	Centralized Network				Cost Range Estimates		Decentralized Network				Cost Range Estimates	
	Denver	States and Wash., D.C.	Districts ESO and OCS	Totals	Low	High	Denver	States and Wash., D.C.	Districts ESO and OCS	Totals	Low	High
Central Processing Unit	1			1	1.5 m	2.5 m	1	11		13	16.0 m	20.0 m
System Printers (> 1000 LPM)	2			2	0.8	0.1	1	11		13	5.2	6.5
Magnetic Tape Drives	4			4	0.05	0.06	4	44		48	0.6	0.72
High Capacity Storage Device	1			1	1.3	1.5						
Medium Capacity Storage Devices	8			8	0.8	1.0	8	88		96	7.6	9.6
Card Reader and Punch	1			1	0.06	0.08	1	11		12	0.72	0.96
Medium Speed Printer (< 1000 LPM)	1			1	0.02	0.03	1	11		12	0.24	0.36
Local Terminal Control Unit	1			1	0.007	0.01	1	11		12	0.08	0.12
Local A/N Video Terminals	2			2	0.008	0.015	2	22		24	0.096	0.18
Local Video Hardcopy Device	1			1	0.006	0.009	2	22		24	0.104	0.216
Local A/N Keyboard Terminals	2			2	0.004	0.007	2	22		24	0.048	0.084
Local Full Graphic Terminals	2			2	0.020	0.025	2	22		24	0.24	0.3
Local Graphic Tablets	2			2	0.009	0.012	2	22		24	0.108	0.144
Communication Control Units	2	11		13	1.3	3.25	2	11		13	1.3	3.25
Terminal Control Units	2	11	66	79	2.37	5.53			66	66	1.98	4.62
Modems	12	12		24	0.17	0.24	12	12		24	0.17	0.24
Remote A/N Video Terminals	2	22	66	90	0.36	0.68			66	66	0.264	0.495
Remote Video Hardcopy Devices	2	22	66	90	0.54	0.81			66	66	0.396	0.594
Remote A/N Keyboard Terminals	2	22	66	90	0.18	0.32			66	66	0.132	0.231
Remote Full Graphic Terminals	2	22	66	90	0.9	1.13			66	66	0.66	0.825
Remote Graphic Tablets	2	22	66	90	0.4	0.54			66	66	0.297	0.396
BLM Transparency Scanner and Cartographic Printers	2			2	0.1	0.4	2			2	0.1	0.4
Estimate Total					10.904m	18.248m					36.335m	50.235m

It should be noted that less expensive terminals with limited capability could still do the job but would require more operator intervention. The same tradeoff could apply for other devices. In addition, a cheaper piece of hardware may in the long run become more costly if a significant amount of software development is required to allow it to function in the operating environment selected.

8.2.2 Teleprocessing Communications Lines

Monthly costs of communication lines were determined for three levels of performance parameters for the teleprocessing network configuration, and are presented in Table 2. The high end of the cost range represents calculated values obtained during the analysis, and the low end reflects a rough estimate of potential savings that might be achieved through special low-tariff services. These costs are for line changes and conditioning, where necessary, and do not include any provision for requisite connecting equipment such as data sets and modems.

A greater potential exists for reducing overall costs by further analysis of communication links vs. line concentration equipment (communication control unit) costs to achieve optimum performance at minimum total (line plus concentration) cost.

Estimated Communication Line Costs ($/month)	Teleprocessing Network Configuration		
	Minimal	Recommended	Future
High	39,500	47,600	129,500
Low	31,600	38,100	103,600

Table 2. Range of Estimated Costs for BLM Intersite Communication Lines

8.2.3 Software

The majority of control systems and network or telecommunication control programs are provided with the hardware by the selected vendor. These software packages vary widely, both in function provided and in the support (installation, training, and documentation) furnished. For these reasons, the estimated costs of these packages cannot be determined. They are often included in the price of the hardware (if micro-coded) or are priced separately but are usable only with the vendor hardware.

The costs contained in Table 3 were derived from various vendors and represent a range which varies directly with the amount of

capability provided. The Bureau should carefully select each package assuring itself that all will function together harmoniously without interface discrepancies and package level incompatibilities.

System of Software Package	Cost/Month	
	Lo	Hi
DB Management System	$250	$600
DC Management System	300	600
Data Retrieval System	150	600
Text Processing System	300	800
Interactive Query Support Package	100	400
Graphic Support Package	500 (purchase)	
Online Data Entry	150	300

Table 3. Software System Costs

Appendix A. ADP CAPABILITIES

A.1 STRUCTURED DATA HANDLING

Update -- Provides the capability of initially loading a structured data set and inserting, replacing or deleting part or all of the contents of the data set. Also, pointers and indices will be initialized and maintained.

Pre-defined Retrieval/Output -- Provides the capability to search through a structural data set until the data specified in a set of pre-defined parameters is found and extracted.

Provides the capability to display the data extracted from a structured data set. The data will be displayed in a pre-defined array and can be altered only by redefining the format to the stored output program.

Ad Hoc Retrieval/Output -- Provides the capability to search through a structured data set until the data specified in a set of parameters entered at program execution time is found and extracted. The search parameters may be altered for each retrieval execution.

Provides the capability to display the data extracted from a structured data set. The data will be displayed in an array which is established at program execution time and can be altered for each execution of the output program.

A.2 MAPPING-GRAPHICS

Data Entry/Modification -- Provides the capability of initially placing digitized map data in the structure data set and altering it by inserting, replacing or deleting part or all of it.

Retrieval/Output -- Provides the capability to search through a data set with geographic or attribute parameters until the specified data is found and extracted.

Provides the capability to display all or part of the map data extracted from the structured data set at the scale specified at program execution time.

A.3 TEXT PROCESSING

Update -- Provides the capability of initially loading a textual format data set and inserting, replacing or deleting part or all of the contents of the data set. The composition of the textual data set may be restructured. Keywords are established and sentences and paragraphs are defined and indexed.

Retrieval/Output -- Provides the capability to search through the textual portion of a textual format data set or the keyword index until the specified keyword is found and the associated text is extracted.

Provides the capability to display all of the data contained in a textual format data set or data retrieved from a textual format data set. The data will be displayed in a pre-defined, standard, rigid format which is established by the system. In the display format such things as indentation, spacing and margins are defined.

Composition -- Provides a full text composition facility with hyphenation, justification, and page formatting. The ability to copy, move, erase, and add text from a single character to a whole identified document is part of this composition capability.

A.4 SPECIAL PROCESSES

These capabilities would provide valuable tools to assist in BLM planning and decision making. They are characterized by the requirements to define complex situation or problem formulation to provide computer assistance in such activities as analysis and forecasting.

A.5 IMAGE PROCESSING

Input -- This capability would provide for the loading of images into a data set.

Processing -- This capability would provide for image creation and registration, i.e., difference, compose, rotate images, register two images, auto correlation, etc.

Pattern Recognition -- This capability would provide for the internal pattern grouping of the image data to determine patterns, i.e., type-map and histogram generation, goodness of fit, computation, etc.

Image Manipulation -- This capability would provide for the manipulation of the data in connection with a display, i.e., scale changes, multiple overlay, etc.

Image Display -- This capability would provide for the display of the image data.

A.6 COMPUTER ASSISTED TRAINING

Remote -- Provides the capability to assist with the training needed by users or suppliers using a remotely located display device.

Local -- Provides the capability to assist with the training needed by a user or supplier using display devices that are tied directly to the computer.

A.7 DATA BASE CONVERSION

This capability would allow the data in an existing data set (automated or manual) to be restructured and stored in new data sets using their specifications. The capability would need the descriptions of both data sets.

A.8 JOB EXECUTION

Interactive On-Line -- This capability provides for data to be directly communicated between the computer and the supplier or user of that data.

Batch -- This capability provides for suppliers or users to communicate indirectly with the computer via computer operations personnel.

Appendix B. DATA SET DEFINITIONS

B.1 VEGETATION

The Vegetation data set contains basic tree and plant data to the detail necessary to support effective BLM management of the timber, forage and related resource programs on federal lands. See the vegetation data menu for details on the data to be included in this data set.

B.2 SOILS

The Soils data set contains basic soil property, use, measurement and class data to the detail necessary to support effective BLM management of watershed, forage and related resource programs on federal lands. See the soils data menu for details on the data to be included in this data set.

B.3 MINERALS

The Minerals data set contains basic minerals qualitative and quantitative data by core/drill hole, seam/field and field/basin to the detail necessary to support effective BLM management of the energy minerals, lands and, related resource programs on federal lands. See the minerals data menu for details on the data to be included in this data set.

B.4 Geologic

The Geologic data set contains basic surface and subsurface geologic feature data to the detail necessary to support

effective BLM management of all resource programs on federal lands. See the geologic data menu for details on the data to be included in this data set.

B.5 WATER

The Water data set contains basic surface and subsurface water property and measurement data to the detail necessary to support effective BLM management of forage, watershed and related resource programs on federal lands. See the water data menu for details on the data to be included in this data set.

B.6 WILDLIFE

The Wildlife data set contains basic wildlife species, herd and population data to the detail necessary to support effective BLM management of the wildlife recreation and related resource programs on federal lands. See the wildlife data menu for details on the data to be included in this data set.

B.7 METEOROLOGY

The Meteorology data set contains basic current and historical meteorological data by station and region to the detail necessary to support effective BLM management of the resource programs on federal lands affected by meteorological conditions (i.e., Recreation, Watershed). See the meteorology data menu for details on the data to be included in this data set.

B.8 RECREATION

The Recreation data set contaans basic qualitative and quantitative recreation site data, both current and potential, to the detail necessary to support effective BLM management of the recreational and wildlife resource programs on federal lands. See the recreation data menu for details on the data to be included in this data set.

B.9 CULTURAL

The Cultural data set contains basic historical, archeological and paleontological evaluation data to the detail necessary to support effective BLM management of cultural and related resources on federal land. See the cultural data menu for details on the data to be included in this data set.

B.10 LAND RECORDS

Land Records data set contains basic current and historical land boundary, ownership and other master title plat (MTP) data to the detail necessary to support effective BLM management of the land records and Realty functions of federal lands as required by law. See the land records data menu for details on the data to be included in the data set.

B.11 CASE FILE

The Case File data set contains basic application, case progress, use stipulations and compliance data to the detail necessary to support effective BLM management of use authorization applications and decisions. See the case file data menu for details on the data to be included in this data set.

B.12 SOCIAL-DEMOGRAPHIC-ECONOMIC

The Social-Demographic-Economic data set contains basic social-demographic-economic data, such as population, income, employment, education, health, social problems, government revenues and expenditures, housing, public opinion, non-BLM sales and industrial investment to the detail necessary to support effective BLM planning decisions for resource management particular locality or region. See the social economic data menu for details on the data to be included in this data set.

B.13 ACCOUNTING

The Accounting data set contains basic fund account and expenditure data to the detail necessary to support effective BLM management of the Bureau allotment, funding and accounting requirements. See the accounting data menu for details on the data to be included in this data set.

B.14 PROTECTION

The Protection data set contains basic current and historical data concerning pest and fire situations to the detail necessary to support effective BLM protection planning and rehabilitation. See the protection data menu for details on the data to be included in this data set.

B.15 PERSONNEL AND ORGANIZATION

The Personnel and Organization data set contains basic information regarding the employees, positions and training programs within BLM to the detail necessary to support

effective accomplishment of manpower planning and utilization, personnel management evaluation, cynical position audits, etc. See the personnel and organization data menu for details on the data to be included in this data set.

B.16 PAYROLL

The Payroll data set contains basic salary, deduction, and timing data to the detail necessary to effectively support the BLM payroll processing program. See theepayroll data menu for details on the data to be included in this data set.

B.17 PROPERTY

The Property Management data set contains basic identification, quantities and location data to the detail necessary to support the effective management of the several types of BLM property. See the property data menu for details on the data to be included in this data set.

B.18 MAILING LIST

The Mailing List data set contains a list of names and addresses of standard recipients of BLM notices, and publications. See the mailing list data menu for details on the data to be included in this data set.

B.19 TEXT/KEYWORD

The Text/Keyword data set contains textual information often indexed by keywords to support many reference and publication functions performed by BLM including Bureau Manual

information, environmental report references, special resource research publication abstracts, etc. See the text/keyword data menu for details on the data to be included in this data set.

B.20 UNIT RESOURCE ANALYSIS (URA)

The Unit Resources Analysis (URA) data set contains basic identification, location, resource and opportunity data to the detail and in the format necessary to support effective preparation of BLM Unit Resource Analysis. See the URA data menu for details on the data to be included in this data set.

B.21 MANAGEMENT FRAMEWORK PLAN (MFP)

The Management Framework Plan (MFP) data set contains information on program activity opportunity, constraints, products, conflicts and multiple use recommendations, alternatives and managerial decisions to the detail and in the format necessary to support effective preparation of a BLM Management Framework Plan. See the MFP data menu for details on the data to be included in this data set.

B.22 MULTIPLE USE ACTION PLAN

The Multiple Use Action Plan contains data on standard, facilitating and protection oriented program objectives and input actions, quantification and priority data for various levels of management. Data is to the detail necessary to support the advanced planning functions of BLM. See the Multiple-Use data menue for details on the data to be included in thisdata set.

B.23 BUDGET ALLOTMENT

The Budget Allotment data set contains basic financial plan, budget estimate, apportionment, and fund allotment data to the detail necessary to support effective preparation, modification and allocation of the BLM annual budget. See the budget data menu for details on the data to be included in this data set.

GLOSSARY

To be provided in the final version.

BIBLIOGRAPHY

To be provided in the final version.

Bureau of Land Management
Library
Bldg. 50, Denver Federal Center
Denver, CO 80225

Form 1279–3
(June 1984)

BORROWER'S CARD

HD
183
.L3
L345
1974

Draft Report, strategic plan for information system.

DATE LOANED	BORROWER	OFFICE	DATE RETURNED
11/27/86	A Kaufman	D-443	06/15/88

USDI – BLM

(Continued on reverse)